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THE DEFINITION OF JUDGMENT

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Attempts to define the nature of judgment, and to give it a definite place in the scheme of psychology or logic, are determined in part by the attitude taken toward certain more fundamental or elementary questions or concepts. Thus, if judgment be described as the affirmation of a relation between two members of a pair of objects or terms, this at once involves a certain meaning of the ideas used in the definition. What is an affirmation as distinguished from a mere formulation or question? What is the 'belief' that attaches to the judgment process? What is the nature of a relation, which can subsist only in the presence of two or more members or fundaments? Or is this in fact the case? What indeed are the members or items between which relations may be established or discovered?

What status in the world do these various experiences have? Which of them, if any, are objects, given in a substantial world, and which of them, if any, represent acts only, on the part of the subject in whose experience the objects are encountered? Are relations 'really perceived'; do they have 'objective reality'; are they in any way classifiable along with weights, colors, tones, and odors? Are they 'contents of consciousness' or only 'relating acts'? Can they be attended to; do they have attributes, corresponding to the quality, intensity, and duration of 'sensations'? Are they, in fact discovered, or are they only made, invented?

Some account must be taken of these questions before

we determine upon a final characterization of judgment. In certain preceding papers, especially those dealing with the psychophysical continuum and with meaning, we have clearly indicated what direction our own answers must take **11, 12, 13, 14.**[1]

Suggested Procedures.—It may be objected that a doctrine of judgment need not involve any presuppositions—that the nature of judgment may be directly ascertained through introspection. The subject may be required to judge, and thereupon to give us an account of what he found in consciousness as he judged. But there are several important obstacles to any such procedure. In the first place, it is quite impossible to give, in any reasonable time, a complete report of all that happens in consciousness even during a period of a few seconds. All that the observer can do is to select from the total experience those events which seem to him likely to have some bearing on the process in which the experimenter is interested, report these, and ignore the remainder.

The introspective accounts of consciousness given in the literature of thinking strike the reader as usually naïve and unsophisticated in this respect, so frankly do they represent only the selection of certain events in the light of preconceived theories and expectations. They almost never, for example, report the outdoor noises, the sight of the apparatus, the sounds of breathing, the movements of the diaphragm, the purposeless activity of the body, the ceaseless movements of the toes and fingers and tongue. It is clear that the reports are of events coming clearly to attention, rather than of all events transpiring. It is the presumably relevant details, rather than the totality of events that is reported.

Either then the subject reports under the influence of a certain selective attention, or else the writer chooses for publication only those items of the report which he considers relevant to the process in hand. Certainly in neither circumstance can a true notion be conveyed of the characteristics

[1] All references are given by number, according to the alphabetical bibliography at the end of the paper.

of the process that occurred, especially in view of the vicarious and symbolic functions of terms and of relations as we have found them in our study of drowsiness, dreaming, and formal thinking **13**.

Special Difficulties.—But a further objection is even more important, from the point of view of experimental technique. The suggestion was, let the subject be required to judge, and thereupon to report the course of consciousness. But this obviously implies that we already know what judging is. Otherwise, how could we require him to judge, and how be sure that he did so? How can we be certain that what he is reporting is really the judgment process?

Thus in one of the earliest studies of judgment by the introspective method, that of Marbe **17**, the investigator, in his own words, sought to learn "what experiences must supervene upon a conscious process in order to raise it to the rank of a judgment. So . . . we place the observer under conditions in which he may experience the most diverse kinds of mental process in their passage to judgments, and then ask him to report what concomitant experiences supervened upon those processes, and endowed them with the character of judgment." Provisionally, a judgment was defined as "a conscious process to which the predicate right or wrong may be significantly applied."

Obviously, the introspective account will relate only to processes coming under this definition (if instructions are followed) since such processes are the only ones directly set up by the experimental conditions. And obviously Marbe's preliminary definition is unsatisfactory, for it would cover also those processes known simply as memory, acts of naming, etc., and it would exclude the verdicts of esthetics and of value, which by rather common consent are also designated judgments.

It is clear enough that when I say that Weight *A*, in the size-weight illusion blocks, is heavier than Weight *B*, this opinion either accords or not with the testimony of the scale beam. When I suggest that Columbus discovered America, this proposition is either confirmed or refuted by authentic

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records of history. But suppose that I am asked to note which of the two weights *seems* heavier. Is not this noting of their *apparent* weight a judgment? But how is its correctness to be determined, or with what other fact, meaning or object is the act to be compared, as right or wrong? Only if I go further than the noting, and also *indicate* one of the weights by word or gesture, can it be said that there is an act (my indicating) which does or does not accord with another fact (the impression actually made on me).

My hostess asks whether she shall put cream or lemon in my tea, whether I like her new hat, and which of two colors is more becoming to her. No matter how I answer these questions, the replies, although they might not *constitute*, would at least *express* my judgment. But with what objects are they to be compared, as right or wrong? My hostess did not inquire whether she should use lemon or cream merely in order to see whether I could *guess* what she was really going to do. Nor does my like or dislike of her hat fulfil any intention on my part to accord with another fact or meaning.

There are then experiences which are commonly called judgments that do not fit Marbe's formula. On the other hand, Messer **18** has pointed out, and Titchener **23** has reaffirmed, that the formula fits many experiences which we are unaccustomed to consider judicial, such as the correct reproduction of nonsense syllables in a memory experiment, the execution of movements by a gymnasium class in response to the verbal instructions of their leader.

It should also be noted that Marbe (as well as others after him) was not looking for the intrinsic make-up or pattern of judgments. Instead he was looking for 'accompanying contents,' 'accessory experiences,' 'attendant phenomena,' 'supervening events,' whose presence should be a constant criterion of judgment. In just this way would a gardener proceed who sought to distinguish watermelons from cantaloupes by discovering types of insect pests, invariably and differentially associated with each. The obvious protest is, Why be so concerned with '*Begleiterscheinungen*'? Why not examine the melons themselves? What we require, first of all,

is a satisfactory phenomenological indication of those events, experiences or processes which the term, judgment, is to denote. Such a definition is to be psychological rather than logical, and is to take due account of the status of the elementary features or processes which it involves. Such an account is what we here seek to present.

No attempt will be made here to evaluate the accounts of the nature of judgment offered by Messer **18**, Watt **27**, Bühler **6**, Selz **20**, Lindworsky **16**, Brunswig **5** and others, on the basis of the method of 'systematic introspection,' except to indicate the chief grounds of their inadequacy. They do not afford us a phenomenological indication. To define the judgment as a process determined in its course and outcome by an antecedent *Aufgabe* is to include entirely too many disparate things under a single heading, with no criteria for their differentiation. To introduce an array of such concepts as '*Wissen*,' '*Bewusstheit*,' '*Gedanken*' and '*Wissensaktualizierung*' is undoubtedly to recognize an important type of phenomenal event. But as these terms have commonly been employed they emphasize a *content* rather than an active procession, and they imply the traditional cleavages of mental and physical, stimulus and experience, which we have found to be the chief impediments to psychological progress.

The Differentiæ of Judgment.—Of the various problems connected with the topic of judgment, we consider first then only that of the differentiae or criteria of judgment as a process, including the relation of judgment to other mental processes or events. First of all should be considered what we may call the *expression* of the judgment. By this we mean the designation of its content by some identifying name or sign which will serve for purposes of communication and record. Classically, the expression of the judgment is the *proposition*. This is a language indication, following the grammatical laws, and subject to all the habits and traditions of speech. Conspicuous among these are the requirements of subject, predicate, and copula.

Much discussion has been occasioned by these linguistic

elements, under the impression that they reflect essential features of the mental experience, and usually without due regard to the accidental and practical factors determining the evolution of speech. But the variety of ways in which a judgment may be expressed should constitute sufficient warning against the confusion of psychology with philology. The judgment, as Marbe realized, may be indicated or communicated by any of a great number of devices, by speech, gesture, by practical adjustment, by sequence of imagery, by change in the direction of thought, by consequent feeling or attitude. Whatever be the nature of the indication, however, it is no essential part of the judgment except as it be conceived as the final event that brings the judgment process to a close.

The Nature of Meaning.—Adopting the redintegrative account of meaning which we have suggested **12, 13, 14,** we may point out again that the processes involved in a significant or mental situation comprise, in their entirety, what we may call thinking. Four features of such a situation have been indicated, which we have named, (*a*) the significant, (*b*) the signified, (*c*) the signifying, and (*d*) the signification. We have shown that the classical theories of meaning each fastened upon one of these features, the exploitation or overemphasis of which determines the content of the theory.

By the 'significant' we mean the instigating event, the sign, cue, stimulus or antecedent, corresponding to what logic terms the 'subject' of the proposition. By the 'signified' we mean the past total-context, of which this cue or a closely similar fragment was a detail, and which corresponds to the 'middle term' of logic. By virtue of the redintegrative sequence (by 'mnemic causation') the present 'significant' functions in a manner which, for given purposes, is indiscernible from the way in which the total antecedent event would function if repeated. The 'signifying' is the fact of this functioning or instigation, the arousal of response, adjustment, image, attitude, feeling, vocalization, or other event, which indicates or expresses or constitutes the direction of function, and corresponds to the 'copula' of logic and to

the 'association' of psychology. The 'signification' is this final event or expression, conceived as the consequent of the antecedent cue, in the light of its past context, and corresponds to the logical 'predicate.'

It is clear that this account of meaning is pertinent to the current definitions and descriptions of 'judgment' as found in contemporary text-books of psychology. In fact, many of those descriptions may be subsumed under Pillsbury's simple definition **19**, according to which judgment is "the ascription of meaning to the given." We may with profit consider some of these descriptions briefly, in the light of the redintegrative formula just reviewed.

Contemporary Definitions.—Consider Binet's definition of judgment **3**, "Three images which succeed each other, the first evoking the second by resemblance, and the second suggesting the third by contiguity," . . . "an association of images, for the time being indissoluble." Substitute for 'image' our term 'event,' and realize that resemblance is partial identity. The 'first event' is the cue, the second is the past total, the third is the final event,—the 'significant,' the 'signified' and the 'significance' of the redintegrative account. And we need not resort to the trick of the invisible image, as did Binet when he found that the presumed 'second image' could not really be observed. Instead, we discover a past episode, which by its very nature cannot be observed, nor is it present.

Warren **26** defines judgment as "the combination of two meanings," . . . "the fusion of two thoughts (of which) some of their meaning elements are similar." Substitute for the equivocal 'thoughts' the 'events' of our own account. The reaction to, or expression of, the fusion of two thoughts thus becomes the redintegrated adjustment or consequent due to the substitute functioning of a 'cue' event for a more comprehensive total context involving similar elements. What is required, in the main, is to escape from the dualistic conception of 'images' or 'thoughts' as peculiarly 'mental,' and to substitute for this conception that of natural processes or events. Judgment thus becomes that total set of processes

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in which we have discerned the four features involved in meaning.

Hoeffding's account **9**, again, stresses a certain aspect of this process. "Two or more concepts are combined, the one being shown to be a closer determination of the other, to present a part, a side, or an effect of what is contained in the other." What is this but the effective functioning of a cue in the light of its determination by a previous total event? Hoeffding's insistence that the judgment is an *analysis* of the 'connected whole' apparently refers to the verbal proposition, which ordinarily *indicates* or *names* these various features, and in that sense may be called an analysis.

In just this way, also, we may interpret Wundt's statement **28** that "If we call the aggregate idea which is subjected to such a relating analysis a *thought*, then a *judgment* is a division of this thought into its components, and a *concept* is the product of such a division." But we should prefer to avoid the mentalistic implications of these names, and take them as referring to parts of a natural series of phenomena, a sequence of events.

Especially interesting from this point of view becomes Titchener's conviction **24** that "judgment belongs to the same psychological genus as voluntary action." He adds to Wundt's 'analysis of an aggregate idea' the 'influence of a foregone suggestion.' This last suggestion is important, for it points to the fact that not every past context in which a present detail has played a part need be effective in the present sequence. This introduces the concept of 'motivation' or 'problem,' which we also attempt to explain in redintegrative terms. Titchener's demonstration that "the suggestion, however, may be present not only as aggregate idea, but also as verbal imagery or as attitude, and it need not be consciously present at all, but may be effective as a cortical set" is also important. It shows us clearly that it is in the nature and sequence of events, rather than in the characteristics of a peculiar field of consciousness, that the phenomena of thinking are to be traced, and that a longitudinal view rather than a cross section of experience is required for an adequate account of thought.

It is obvious that Pillsbury's account **19** of judgment as the process of "ascribing meaning to the given" hinges upon the account to be given of the nature of meaning. The redintegrative account, which we have given, is as a matter of fact very aptly summed up in Pillsbury's words. The *given* is the clue detail. The *meaning* is the efficacy of the historic context. The *ascription* is the effective instigation of a consequent, whether this be image, act or verbal indication. But we should, as will later be indicated, reserve the term 'judgment' for a less inclusive situation, and employ the term 'thinking' for this general meaningful process.

Consider further the account of Dunlap **8**. "In judgment one of the subsidiary concepts, with a definite system of relations linking it to the general concept, simply becomes more vivid." Aside from the mentalistic terminology, this is almost a paraphrase of the redintegrative formula. We may be sure from the context that the mentalistic implication of such terms as 'concept' and 'vivid' is foreign to Dunlap's intention, and that we may substitute 'event' for 'concept,' and 'effective' for 'vivid,' without doing violence to the essential purport of the definition.

Calkins's statement **7** is that "judgment, structurally regarded, is a complex of elements of consciousness, characterized by the relational experience of 'wholeness.' The related object of judgment may be of any type: external thing, other self, inner experience (my hat, my friend, my theory)—that is, I may regard any one of the three as a complex whole and may emphasize by my attention a character included as a part of this whole or else excluded from it." As we have seen in our own analysis, the essential thing about the thinking process is the part-whole efficacy of a detail. Calkins's emphasis of the part-whole relation, as that of Wundt and Dunlap also, fits perfectly into this account, if we substitute action or sequence for attention, or even consider attention in the light of an event or an adjustment.

Idealists and Objectivists.—In considering the psychology of meaning, we saw that even the accounts of that process

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offered by the logical idealists and by the doctrine of intentionalism fit readily into the redintegrative formula. We have now to suggest that the idealistic accounts of the nature of judgment fit equally well into this paradigm. Thus Bosanquet **4** concludes, "Judgment, as we have seen, is primarily the intellectual act which extends a given perception by attaching the content of an idea to the fact presented in the perception . . . . The 'idea' of which I am speaking is, of course, not the particular existence or single occurrence of a psychical image; it is the general signification for the sake of which we use the psychical image."

It is not difficult to translate into the language of our simple psychophysical continuum of events the terminology of the idealistic logic, with its wierd machinery of 'Reality,' 'psychic particulars,' and the intermediate realm of 'floating adjectives' and 'universals.' One who becomes familiar with both languages readily discovers that they are describing the same facts. Thus we may attempt to paraphrase Bosanquet's definition of judgment **4** as follows: Thinking ('judgment') is primarily a series of events ('intellectual act') in which a detail event ('a given perception') functions for an antecedent total situation ('is extended by attaching a general signification'). Once the items involved have been simply characterized, in other words, the redintegrative formula satisfies the demands of even the idealistic logic.

It seems unnecessary to give any detailed account of the view of von Bechterew **25** and the objective psychologists in general, since the doctrine of 'reflexology,' in the case of the thought processes is but a special case of the application of the redintegrative formula (aside from the dualistic implications of objectivism). For the objectivists, thinking is merely a series of overt or incipient speech reactions of the associative type. The expression of a judgment is the discharge of an overt or inhibited or incipient 'word reflex.' With a given objective situation, say the relation and sequence of two weights, under special instructions, comes to be attached the vocalization 'heavier.' The calling out of this vocalization is all that is involved in judgment, once the

association has been established. So we name the external relations, just as we name the simpler stimuli, or react to them in selective fashion.

Some such account also will probably be given by the 'behaviorists' in general, when the time comes for them to go beyond the curves of learning, the discrimination of wave lengths, and the salivary secretions. We have already had occasion to emphasize that the 'conditioned reaction' here relied on represents only a special case of redintegrative sequence. Thus are such strange bedfellows as the behaviorists and the idealistic logicians brought together by the redintegrative formula. We can scarcely expect either to rest easily.

Judgment and Belief.—Up to this point the definitions of judgment considered have really been seen to be descriptions of all thinking. This similarity is one reason why many have been disposed to reject the word 'judgment' as relating to any special psychological experience. There is, however, another group of definitions of judgment which seek to differentiate it from other processes. Judgment is held to consist not merely in the *awareness* of aggregate idea and the vividness or effectiveness of some of its parts, nor merely in the *thought of* the relation between two items; but the essential factor therein is conceived to be the attitude of *belief*, i.e. the *acceptance* or *assertion* of the relation as actually existing.

Thus Thorndike **22**, writing of judgments, says, "They are feelings that a certain state of affairs is or is not the case, that a certain relationship does or does not exist between certain things. They are feelings which affirm or deny something of something."

More explicit in this recognition of judgment as a special 'Yes'-'No' consciousness, identical with *belief*, are Brentano and Stout. We may quote from Stout **21**, who bases his account essentially on Brentano's earlier one. Distinguishing the Cognitive from the Conative 'aspects of our nature,' the Cognitive is seen to have three 'modes of consciousness,'—sentience, simple apprehension, and judgment or belief.

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"Judgment is the Yes-No consciousness. Under it I include every mode and degree of affirmation and denial—everything in the nature of an acknowledgment explicit or implicit of objective existence. I use the term Belief as a convenient variant for Judgment."

Speaking generally, we have indicated but two groups of doctrines, definitory of judgment. The first group fall readily under the redintegrative formula, as descriptions of *thinking in general*, in which the essential feature is the phenomenon of meaning. The second group of doctrines seek to differentiate judgment from other processes on the basis of confidence or belief. We have now to suggest such conclusions and reconciliations as seem to lead to a more satisfactory use of the term, judgment, and of certain other terms commonly associated with it.

A Tentative Definition.—In a preceding paper [11] we described four 'fundamental types of report,' characterized by varying degrees of confidence. It was there suggested that these types of report correspond approximately to the popular uses of several psychological categories. In connection with this account it was suggested that these uses of the psychological terms were not entirely to be recommended without more careful definition.

Distinguishing four degrees of confidence on the basis of empirical data and experimental results, it was proposed that the term, judgment, be employed to indicate those reports which are attended by the third degree of confidence. The following table will summarize and review the results of the earlier discussion.

Degree of Confidence	Percentage of Correctness	Psychological Category
A	95	Perception
B	80	Judgment
C	70	Belief
D	60	Feeling
E	50	Guessing

We now suggest that this distinction on the basis of 'degree of confidence' affords a definition of judgment that

takes careful advantage of such merit as is possessed by the second general group of doctrines, illustrated in our account by Thorndike, Brentano, and Stout. We must add to those doctrines the observation that belief is not an all-or-none experience, but displays degrees and gradations. Instead of identifying judgment and belief, then, we should prefer to adopt them as the names of processes which proceed with different degrees of assurance.

There is thus suggested a phenomenological definition of judgment, a designation of that conscious situation or process which we might well agree to call by that name. It is characterized, in general, by the criterion suggested by Woodworth,—it is an answer to a question. In this sense there is no peculiar conscious quality that belongs to it. But we have suggested a further limitation, of the specific rather than of the generic kind. Expressions of feeling, belief, and perception are also, in a sense, answers to questions, solutions of problems, resolutions of doubts. Hence we suggest that the degree of confidence constitutes the peculiar conscious mark that distinguishes these types of answer one from another.

In leading up to this definition **11**, **12** it was necessary to eliminate the sharp distinction between the mental and the physical orders and to give relations a status of real existence, as direct objects of report. This was true not only of relations of comparison, but of all relations whatsoever, as well as of the relational complexes and structures which comprise form, pattern, and arrangement. On this basis, the sequence, the intervals, the harmonies and the melodic patterns are directly encountered in experience, just as are the tones and noises between which these relations subsist.

However, there is no reason to suppose that confidence displays sharply marked stages or degrees. Instead, we must suppose, in the light of experimental evidence, that it is a continuous function of the difficulty of the situation, the completeness of the data, the accuracy of the reaction, and perhaps, of the mode of report. The stages we have here designated are therefore more or less arbitrary, although they

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are surely more faithful to the facts than is the sharp distinction of affirmation from denial. The whole topic of confidence and belief merits more careful examination than we can give it at this point. For the present we must conclude that the second group of doctrines, even with our attempted modifications, fails to give precise and adequate differentiæ of judgment.

Judgment as Type of Report.—We may turn then to the first group of definitions, which in attempting to define judgment, described instead the characteristics of all thinking, namely, redintegrative sequence. If we call the 'consequent event' of our more formal discussion the 'response,' it may be pointed out that a response may be evoked in various ways, a report based on various grounds. It may be a response to an original total situation, or it may be evoked by a partial detail or secondary cue. This cue is thus a vicarious stimulus, a substitute or symbol, and may, as such, be an event of any sort, quality, pattern, relation or process. And again, a detail, as a word, associated with this vicarious stimulus, may in its turn act as a vicarious substitute for the original symbol.

There is consequently another sense in which the terms 'judgment' and 'perception' may conveniently be distinguished, and both of these thereby related to another process which may be known as 'inference.' This distinction is particularly applicable to the process of comparison and the verdicts thereby achieved. Judgment has been defined, as we have seen, as the affirmation of a relation. But this is a generic, not a specific definition. There are several other ways of knowing a relation—at least three distinguishable ways—and it seems useful to designate only one of them by the name 'judgment.' Experimental studies afford many examples in almost every field of these various procedures.

The Report of Perception.—As has already been pointed out, relations are found in the world, not manufactured by the apperceptive machinery. But relations may be discovered in more than one way. The simplest way is that of directly encountering them and knowing them for what they

are. Thus I hear two tones in succession, and directly perceive their sequence. The sequence is or may be quite obvious, and quite as directly encountered as are the tones themselves. What I find will depend in part on what I am looking for. Thus if I am looking for pitch relations instead of temporal ones, the latter may go quite unreported. Or if I am on the lookout for number, neither pitch nor sequence may be noted. But all of them are there, just as surely as the tones are there, and in the same sense.

Indeed, the first thing to be apprehended may be the relation for which I am looking. Or I may get the relation while confronted by but one of the members of the pair, as when I note that a change has occurred without knowing the objects between which the relation of difference subsists. In the same way I am at once aware of the similarity of two colors, of the equality of two weights, of the relative beauty of two objects, or the desirability of two alternatives. And in all these cases the relation may be clear and distinct, its certainty may be great, and its expression explicit. Indeed these circumstances are usually the case in this mode of apprehending relations.

But this is not judgment, in any meaningful sense. If words are to mean anything at all, this is perception. It is the direct presence of an experience in consciousness, in its own character. The fact that the experience is relational, rather than olfactory or kinesthetic, makes no difference in the process of reporting or apprehending it. If I name the relation, I name it in the same way that I name any other object or event. But naming is only a reaction to an object, just as kicking it or picking it up might be. It is a perceptual reaction in this case.

The Judgment Report.—However, there is still a second mode of apprehending relations, which, as a process, has peculiarities of its own, a process which has often been described, and sometimes called 'mediate perception.' I may in comparing two movements affirm one to be longer than the other, not because of a direct apprehension of space relations, but instead because one movement required a longer time

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for its execution. I may affirm that today's sky is clearer than yesterday's because, on observing the shadows on the ground, I find them more distinct. I may compare the pitch of two tones not by apprehending this relation itself, but by comparing the laryngeal movements involved in reproducing them. Similarly, I may estimate one garment to be of better quality than another, not by a direct comparison of texture, but by inspection of the price tags.

In these cases the primary relation is affirmed, and usually with certainty and accuracy only less in degree than that which attends direct perception. But this is not on the basis of direct apprehension. In each case the knowledge of the relation is mediated. By comparing *C* and *D*, in which I directly perceive a relation of one type, I know or report the relation of *A* and *B*, which may be of quite another type. Even the quantitative or qualitative categories may be reversed. Thus a *space* relation is affirmed on the basis of a perceived *time* relation. And on the basis of a *shorter* interval I may even affirm a *longer* movement. This mediated type of relational report may in a significant sense be called judgment. Such a usage accords with a common meaning given to this term in daily life. Thus the eye-witness directly perceives the criminal's guilt. But the magistrate or jury can only judge it, on the basis of a comparative study of the testimony. When direct observation fails we rely on our judgment, that is, on our apprehension and interpretation of secondary relations.

In all these cases of judgment a real comparison of objects has occurred, but the objects directly compared are not the objects that are judged. This difference of objects is what distinguishes judgment from perception, and the presence of comparison is what distinguishes judgment from another process of report which may be called inference.

The Nature of Inference.—In what we shall call 'inference' a relation is known through a mediating process also, but not through a relation. Thus I may assert that one weight is lighter than another because, when I lifted it, it flew suddenly up into the air, or because I see the other weight tip

the scale beam. I infer one time interval to be longer than another because I found myself to be restless and impatient long before it ended. I conclude that one automobile is better than another of the same make because it is used as a demonstration car, or that one man is wealthier or less ambitious than another because he plays golf or chess. I infer that last winter was more severe than this because I remember that the street cars were stopped for several weeks. Here the comparisons are mediated by a process which is not itself a comparison—by a bit of extrinsic knowledge that is taken simply as a sign, symbol, or index of a certain relational status of the primary objects of thought.

Here then are three processes, perception, judgment, and inference. They are distinguished not by the presence or absence of characteristic introspective content, so far at least as we have described them, but rather by the technique of their operation and especially by the nature of the data on which they are based. They are, to be sure, not sharply separated in their occurrence. Thus the so-called perception of distance probably involves all three processes—direct perception of linear magnitudes, judgment on the basis of eye-movement and accommodation strain, and inference on the basis of intervening objects, rate of motion, haziness, and color. Moreover, a concrete performance, such as that of judging distance, perhaps changes in character or process with age, experience, emergency or circumstance.

Belief and Testimony.—In addition to these three familiar processes there is a fourth way of apprehending or reporting relations. This is the process in which we accept their presence on the testimony of another person. My instructor informs me that, with a given luminosity, printed matter is more legible in red light than in blue; or that he that ruleth his spirit is greater than he that taketh a city; or that auditory reaction time is shorter than visual. I have faith in the honesty of the instructor and hence I *believe* in the relations he asserts, and may report them on the basis of this belief.

This is a more remote apprehension of relations than is any of the three other processes. It is not strictly an appre-

hension at all, perhaps. Still, I do act upon these relations and allow them to control my deliberation and my conduct. They may in some cases be supported by vague and unanalyzed inclinations or by *feelings* of my own. In a sense they are my beliefs, rather than my inferences, or my judgments or my perceptions. In the absence of innate ideas and of inspired revelation, these four processes seem to constitute our only modes of apprehension.

These definitions of inference, judgment, and perception parallel in a fairly definite way the distinctions we have previously made (on the basis of degree of confidence) between perception, judgment, and belief. Inference is ordinarily less certain than judgment, and judgment less assured than perception. All signs may occasionally fail, and indirect comparisons sometimes go astray, but perception is always what it pretends to be, if its objects are correctly indicated.

Final Definition of Judgment.—We have thus sought to give the term judgment a definite and a specific connotation. It is not merely a name for the process of expressing or indicating a verdict, nor is it merely a particular feeling or a peculiar Yes-No consciousness. Nor is it an analysis of an obscure aggregate-idea, nor a synthesis of two images, nor an articulation reflex. It is instead a *process*, a characteristic *procession* of events, wherein there is involved the indication of one relation, not through its direct perception and report or naming, but on the ground of the perception of a second relation instead. The immediate recognition of the relation of two weights is perception. The step from comparison of motor reactions, or lifting movements, or time relations, to the report of weight relations, represents judgment. Report of weight relations based on a feeling of surprise or of fatigue, with no direct comparison involved, represents a case of inference.

Consider the awareness of change in any state of affairs,—change in the pitch of a tone, the color of the sky, the temperature of the room. If it is directly apprehended as a transition, this is the perception of change. But if one achieves the

knowledge by comparing cross sections of the facts, taken at successive intervals of time, and thereby concludes that the situation has changed, this is judgment. Or it is also judgment if, by observing the increasing brightness of the sun, or the increased or decreased number of people walking in the park, I conclude that the sky is changing in color or that the outdoor temperature is changing. I have compared, and by comparing have achieved knowledge of a relation. But the compared objects were not those between which the affirmed relation subsists. Judgment, that is to say, always relies on secondary or accessory criteria, but these are themselves relations.

The knowledge of time affords a neat instance of all three modes of reporting relations. Thus very short intervals may perhaps be directly compared or estimated. Somewhat longer intervals are judged on the basis of secondary criteria, such as the phase of a motor process, sensations of strain, feelings of impatience, and the like. Still longer intervals or periods are inferred on the basis of position of the hands of a clock, or on the basis of other remote and non-temporal and non-relational premises.

Methods of Inquiry.—How now may we know, in a given case, whether the report of a relation is immediate and perceptual, indirect and judicial, derived and inferential? There seem to be at least two ways of knowing. One way is through the direct observation of ourselves or through the testimony of others concerning their self-observations. The other way is by interference with the presumed base of operation, in the endeavor to learn whether such interference upsets the process of knowing, or the quickness, certainty or correctness of the verdict. Perhaps a third method is also to be indicated,—that of learning whether the verdicts agree more closely with the true relations of the objects judged, or with the relations of the processes indirectly relied on. In some connections we may have occasion to use all three of these methods. All of them are subject to certain sources of error, and perhaps certainty can be arrived at only through the combination of all methods.

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Any one of these methods, used alone, leaves much to be desired. Thus the first method, that of direct observation, is more fruitful in negative than in positive results—it is easier to focus upon a conjectured process and report its absence than it is to describe the complete enterprise. Thus in Bentley's **2** study of the 'Memory Image and Its Qualitative Fidelity,' he sought, through the method of direct report, to determine whether the image is necessary, as a factor in a comparison, in reporting the relations of grays and colors. He concludes that images are not necessary for such report, and writes as follows:

> It frequently occurred with all observers that a judgment was given with no hint of a comparison of two stimuli. Even where no active recollection was possible, no vestige of an image surviving the interval, a decision came like a flash, with the giving of the second stimulus. By much questioning we found that the observer's confidence in the correctness of his decision was quite strong in such cases, but usually he was entirely at sea when asked how he made the judgment. The expression of sameness or difference seemed on the tongue in the instant, without the vaguest allusion to anything past or absent. . . . The work seems all to have been done for consciousness. . . . A certain stimulus, if presented after another, sets the organism in a particular way.

Such negative results as these, in later experiments by the students of the thought processes, have led to the assumption of pure thought elements of various kinds, to take the place of the more conventional elements which were sought for but not found. But it should be pointed out that the fact that observers may be 'quite at sea' in their efforts to describe a process is scarcely equivalent to the positive description of a new and unique process.

The second method, that of interference with the presumed base of operation, may also be readily illustrated from the classical experiments on comparison. Thus Lehmann **15**, in his studies of 'Recognition,' made certain assumptions concerning the mechanism of report. He writes, "If one has a sensation *A* and after an interval of time is given

another sensation X, and is required to state whether this X is the same as A or different, such a report is impossible unless there is a memory image of A with which the present sensation may be compared."

He then points out that, if the image is really so used, certain consequences should follow. Especially, the process of report should be made more difficult and less accurate by interfering with the use of this image in certain ways, such as increasing the number of sensations among which a single one is to be recognized, decreasing the magnitude of the difference, lengthening the interval between the original experience and the moment of comparison, forcing the comparison before practice has enabled the individual to form vivid images of the standard, and choosing as subjects individuals with weak imagery powers.

He then performed these variations, and found, as he predicted that the process of report was impaired and rendered less accurate. But unfortunately this is only affirming the consequent, and by no means proves that Lehmann's original assumption as to the use of the image is correct. Affirming the consequent is a dangerous experimental fallacy, which, however, characterizes many of the earlier studies of the process of comparison and report.

Another early example of the use of the method of interference is in the case of Angell's study 1 of the 'Discrimination of Clangs.' This author sought to test the memory image theory of comparison by introducing various distractions which might be supposed to interfere with the preservation of the image and thus to impair the process of report. The distractions included adding, counting metronome beats, reading, listening to read material, and working with other noises, in the interval between the two clangs to be compared.

The most striking result of his experiments on this point was the failure of the distractions to produce any considerable loss of accuracy in report. He concludes, "The main conclusion to be drawn from the distraction experiments is that judgments of tone discriminations can take place, and in the majority of our experiments did take place, without

conscious comparison between the present sensation and the memory image of a past sensation."

Inasmuch as the author called for no direct observations, but relied solely on the method of interference, this conclusion is of course an inference. It assumes that the 'distractions' did actually incapacitate the memory image, but that this incapacity had nothing to do with the report. Such an assumption is perhaps unwarranted, at least until it has been clearly proven that such distractions actually do incapacitate the memory image and unfit it for use.

This method of interference is an interesting one, however, and I am only pointing out some of the difficulties of analysis that are encountered in the interpretation of its results.

We may illustrate these three methods of inquiring into the criteria of report by referring to the investigations of the basis of our knowledge of the extent of our own movements. With reasonable accuracy, two hand movements may be made so that the stretches traversed by a given point on the moving member may be of equal extent. Or, of two such movements made, we are able to report that one was longer than the other. What are the criteria used in making such reports, and are the reports such as we would call direct perceptions, or are they judgments or perhaps inferences? How do we know the extent of our own movements? Since the question as thus put is a very complex one, we may simplify it by asking merely whether perhaps reports of extent are not always judgments, based on the comparison of the durations of the respective movements.

By the method of direct observation we note whether our reports of extent actually do involve preliminary comparison of the durations occupied by the movements. Observation informs us that this is by no means always the case, although it may tend to become so in so far as the movements become automatic. Subjects may make fairly correct reports of extent without the comparison of durations ever having occurred to them as a possible criterion.

By the second method, we may take duration as a presumed criterion, and proceed to interfere with its use. Thus

we compel one movement to be made at one rate, the other at another rate. Such interference we find by no means incapacitates the subject for the comparison of the extent of movements, or for the reproduction of movements equal to a given standard of extent, although the error of report becomes somewhat greater in these circumstances.

According to the third method we ask for reports of extent of movement. Meanwhile we record also the durations of the movements that are being reported. We may now compare the verdicts, on the one hand, with the actual relations of extent, and, on the other hand, with the incidental relations of duration. If the verdicts agree more closely with the relations of the durations than with those of the extents, we may surmise that it was really the temporal relations that determined the direction of the reports. Or we may reverse the situation, by requiring our subject to report upon the durations deliberately. We may then compare his verdicts with the actual durations and with the incidental extents. Furthermore, we may compare the express reports of duration with the express reports of extent. If one type of report is derived from the other, we shall not expect to find the derived reports more accurate than the primary verdicts themselves.

In a previous study **10** of 'The Inaccuracy of Movement' I have reported such an analysis. "Summing up the results of the experiment . . . we may say that although the argument is not overwhelming, the balance of evidence seems to show that while deliberate times are somewhat more accurately reproduced than deliberate extents, incidental times show an error greater than either, and this fact, along with the character of the Constant Errors points to separate processes" underlying the reports of the two magnitudes. "There is at least no justification for the attribution of more fundamental character to either . . . ."

By such methods as these we may in any given type of report study the importance of various criteria. It will not uncommonly be the case that verdicts concerning a given kind of material (such as extent of movements, pitch of tones,

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heaviness of weights, and the like) may be arrived at through all of the methods we have here described,—that is, depending on the circumstances, they may represent perceptions, judgments, inferences or beliefs. In another connection it would be profitable to survey the various fields and materials in which experimental work has been done, and to exhibit these various modes of report in them.

To designate all verdicts as judgments, merely because they report relations between terms, is quite to overlook the actual psychological processes in favor of the mere verbal propositions that communicate the verdict. The fact that logic has come to call any verbal declarative proposition a judgment should not be allowed to confuse psychological inquiry into the actual processes of thinking. Nor should it deprive psychology of a legitimate and specific use of the term 'judgment.'

Conclusion and Schema.—On the basis of these distinctions our classification of the various processes is as follows:

(The Signified) Total Context with the Original Effectiveness	(The Significant) Present Item, with Redintegrative Effectiveness	Psychological Category of the Report or Consequent
A natural relational situation	Identical or similar natural relational situation	PERCEPTION
A natural relational situation	A surrogate natural relational situation	JUDGMENT
A natural relational situation	Effective item or quality, not itself a relation	INFERENCE
A natural relational situation	A surrogate verbal communication, or other form of personal intimation	BELIEF

These definitions have various advantages over those suggested on the basis of degree of confidence. 'Perception' retains its position as the name for a direct encounter. 'Feeling' is released for use in indicating the affective events, which are themselves a particular type of object. 'Belief' is given a connotation at once definite and in keeping with the common recognition of its personal ground, namely, that belief applies only to propositions, these being personal acts. 'Judgment' and 'Inference' are given specific meanings, which would, if adopted, interfere with the loose use of those

terms that is now the fashion. But the well-known difficulty of securing precise use of terms in psychology will effectually prevent these definitions from interfering with the literature.

BIBLIOGRAPHY

1. Angell, F., 'The Study of Clangs,' *Amer. J. Psychol.*, **11**, 1899; **12**, 1900.
2. Bentley, M., 'The Memory Image and Its Qualitative Fidelity,' *Amer. J. Psychol.*, **11**, 1899.
3. Binet, A., 'The Psychology of Reasoning,' 2d Ed., 1907.
4. Bosanquet, B., 'Logic,' 2d Ed.
5. Brunswig, A., 'Das Vergleichen und die Relationserkenntnis,' 1910.
6. Bühler, K., 'Uber Gedanken,' *Arch. f. d. ges. Psychol.*, **9**, 1907.
7. Calkins, M. W., 'A First Book in Psychology,' 4th Ed., 1914, Ch. X.
8. Dunlap, K., 'A System of Psychology,' 1912, p. 303.
9. Hoeffding, H., 'Outlines of Psychology,' 1901, p. 175 *ff.*
10. Hollingworth, H. L., 'The Inaccuracy of Movement,' *Arch. Psychol.*, **13**, 1909.
11. Hollingworth, H. L., 'The Psychophysical Continuum,' *J. Phil.*, Mch. 30, 1916.
12. Hollingworth, H. L., 'Meaning and the Psychophysical Continuum,' *J. Phil.*, Aug. 2, 1923.
13. Hollingworth, H. L., 'Symbolic Relations in Thinking,' *J. Phil.*, Sept. 13, 1923.
14. Hollingworth, H. L., 'Particular Features of Meaning,' Psychol. Rev., Sept., 1924.
15. Lehmann, A., 'Uber Widerkennen,' *Phil. Stud.*, **5**, 1899; **7**, 1891.
16. Lindworsky, A., 'Das Schlussfolgernde Denken,' 1916.
17. Marbe, K., 'Experimentelle-psychologische Untersuchungen über das Urtheil,' Leipzig, 1901.
18. Messer, A., 'Experimentelle-psychologische Untersuchungen über das Denken,' *Arch. f. d. ges. Psychol.*, **8**, 1906.
19. Pillsbury, W. B., 'The Psychology of Reasoning,' 1910, Ch. IV.
20. Selz, O., 'Uber die Gesetze des Geordeneten Denkverlaufs,' 1910.
21. Stout, G. F., 'Analytic Psychology,' 1909, Ch. V.
22. Thorndike, E. L., 'Elements of Psychology,' 2d Ed., 1907, p. 71 *ff.*
23. Titchener, E. B., 'Lectures on the Experimental Psychology of the Thought Processes,' 1909.
24. Titchener, E. B., 'Text-Book of Psychology,' 1910, pp. 540 *ff.*
25. von Bechterew, 'Die Objective Psychologie.'
26. Warren, H. C., 'Human Psychology,' 1919, p. 326 *ff.*
27. Watt, H. J., 'Experimentelle Beiträge zu einer Theorie des Denkens,' *Arch. f. d. ges. Psychol.*, **4**, 1905.
28. Wundt, W., 'Outlines of Psychology,' 3d Eng. Ed., 1907, p. 302 *ff.*

THE PSYCHOLOGY OF PLEASANTNESS[1]

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Psychology is today concentrating its efforts more than ever on the problem of the affective processes and the related emotional experiences. Such a statement may be colored, no doubt, by the professional interest of the psychologist concerned; while he is engaged in working out a problem of this type, he may magnify the goodly company in which he finds himself. But even with this qualification set before him the author still is strongly convinced that psychologists are now digging deeper than ever into the wondrous cavern of the emotional life. In a description of the Carlsbad cave of New Mexico published last year[2] we find the following statements:

> "Very little accurate information relative to this cave is available. Few measurements have been made, and it is a well-recognized fact that, in dimly lighted caverns, imagination runs ahead of the tape line. The guide is the only source of such meager information as may be obtained. Far be it from me to cast aspersion on an estimable guide whose business it is to entertain his guests. Like other guides before him, he has discovered that tourists appreciate hair-raising yarns more than hair-splitting distinctions. According to his own statement, our guide does not allow dull fact to interfere with a good story."

We might go on with the comparison; but the phrase that is most applicable to the present status of the affective life is, "*imagination runs ahead of the tape line.*" Formerly, it described the work in animal and child psychology, to say nothing of the history of psychology as a whole; in recent

[1] Presented in slightly modified form at Wellesley College, Nov. 13, 1924.

[2] Lee, W. T., 'A Visit to the Carlsbad Cavern, New Mexico,' *Natl. Geog. Mag.*, 45, 1924, 1–32.

decades it epitomizes the work on the emotions. Imagination is hereby not to be condemned, but we need now most of all the use of the tape line.[1]

"The confused view which psychology formerly had regarding the feelings is partly responsible for our lack of detailed information concerning the practical working of feelings in connection with perceptual and thought reactions. The extreme difficulty in experimental work on feelings is the other cause of our ignorance. The study of feeling is one of the most important tasks of experimental psychology in the future, and there is no ground for doubt that the study will advance satisfactorily. Too much effort has been put in the past into the so-called 'introspective method' in studying feeling, and the substitution of the experimental method will unquestionably make future efforts more profitable" (**19**, 322–323).

Much has already been written about the emotions. Classifications have been drawn up; descriptions of emotional states have been bound up into volumes; expressions of the emotions have been done up in attractive photographs; and theories of the origin, function, and nature of the emotions have stirred up no end of discussion. But scarcely a psychological *fact* has been found. We do not know today scientifically what an emotion is. Only a few months ago one of our leading psychologists told his professional colleagues that the chapter on the emotional life of man in our systematic treatises is a scandal to psychology.

On the surface this statement may appear to be rash. Naturally, in our text-books we do not intend to give the elementary student the impression that we know little about emotions, but even in a few of these books we find statements indicating an inadequacy of treating the subject. Angell says, for example (**3**, 374):

> "Many classifications of emotion have been proposed, but we shall only mention one, as the others do very little to aid in the appreciation of the inner nature of emotional conditions. Indeed, the one we cite has not as yet proved itself especially fertile."

From another angle Calkins says:

> "A further consideration of these results of our inquiry leads us to a study of the physiological conditions of affective

[1] "Two of the most characteristic features of modern psychology are (1) the special attention given to the facts of emotional consciousness, and (2) the persistent endeavor to obtain a quantitative statement of results." From the 'Foreword' by W. Brown to W. W. Smith's 'The Measurement of Emotion' (**54**, 7).

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> elements of consciousness. These, to be sure, can be only hypothetically assigned, because they have eluded discovery by direct experimental or by pathological methods. We must proceed cautiously in the absence of direct experiment . . ." (12, 209).

McDougall believes that we have been using a wrong method when he says:

> "The insistence upon introspection as the one method of the science tended to prolong the predominance of this narrow and paralyzing view of the scope of the science; for the life of emotion and the play of motives is the part of our mental life which offers the least advantageous field for introspective observation and description" (41, 6–7).

Again he says:

> "The failure of earlier writers to arrive at the conception of the sentiments must be attributed to the long prevalence of the narrow and paralyzing doctrine according to which the task of the psychologist is merely to observe, analyze, and describe the content of his own consciousness" (41, 122–123).

The classical statement made several decades ago by James is:

> "But as far as 'scientific psychology' of the emotions goes, I may have been surfeited by too much reading of classic works on the subject, but I should as lief read verbal descriptions of the shapes of the rocks on a New Hampshire farm as toil through them again. They give one nowhere a central point of view, or a deductive or generative principle. They distinguish and refine and specify *in infinitum* without ever getting on to another logical level. Whereas the beauty of all truly scientific work is to get to ever deeper levels" (30, II, 448).

Titchener has given us perhaps the most vivid picture of the systematic dearth of material and of the underlying causes of this state of affairs. He does not hesitate to take the elementary student into his confidence (61, 472–473):

> "We have very elaborate accounts of the 'expression' of emotion and we have elaborate diagrams, so to speak, of the emotive consciousness; but, so far as the author is aware, we have no systematic description of emotion, taken under

standard conditions. In other words, we have no first-hand analytical psychology of emotion; and it is this lack that makes the chapter on emotion in the text-books the dreary reading that it is. Two reasons are usually given for the deficiency: first, that it is impossible to bring emotion into the laboratory; the emotions there set up are artificial, washed-out, insipid affairs; and secondly, that we have no method for the study of emotion, since attention to affection defeats its own object. Neither reason is valid. It is not difficult, with a little ingenuity to arrange situations in the laboratory that shall arouse a fairly wide range of emotions. If these emotions are not of the very intensest, neither are the ordinary emotions of every-day life; and if they tend to disappear with repetition of the situations, our every-day emotions do the same thing. Besides, the laboratory offers the very great advantage of isolation; we can get the emotion pure, and without interruption from extraneous processes. On the other hand, it is not necessary to affective introspection that attention be directed upon the affection. Recent work has shown that, if attention is directed upon the stimulus, the situation, an affective judgment comes directly, of itself; the quality and intensity of the affection touch off the corresponding expression or report. Nothing more is required than that the observers shall be fittingly instructed, affectively predisposed . . . . The reason, then, that our descriptive psychology of emotion is schematic rather than analytical is, simply, that experimental psychology has so far found neither the time nor the courage to take emotion into the laboratory. But we shall presently have analyses of this, as we are beginning to get analyses of the action consciousness."

In another volume, written for instructors in laboratory courses, he is, if anything, still more explicit (**60**, 149–150):

"The unsettled state of the psychology of the affective processes is something of a scandal to experimental psychology, although excuses for it are not far to seek. (1) The processes themselves are notoriously elusive, disappearing as we try to attend to them, and translating themselves into ideas at the slightest possible provocation. (2) We get no direct aid from physiology. There is no peripheral organ, as there is in the case of sensation; and the central conditions of feeling are simply

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matters of speculation. (3) It is true that we get indirect aid from physiology, in the form of the 'method of expression.' The curves of breathing and volume and pulse doubtless tally with the variations and trends of affective consciousness. But until we know the affective consciousness itself, how are we to be sure of interpreting our curves? One has not to go far into the literature to find what one is tempted to call ridiculously different readings of the same curve. (4) As for psychological methods, to supplement the physiological, we have only (*a*) the method of impression, which holds out no promise of ever settling the question of the number of affective qualities, and (*b*) the method of suggestive disintegration, which attempts to analyze out of each of these qualities by suggesting the others away—itself at present rather a crude suggestion of method than a practicable rule of working. (5) Corresponding to this dearth of settled facts, we have a hypertrophy of theory and a large controversial literature. Partly because the theories are intrinsically interesting, and partly because of the sheer bulk of the literature, the fundamental issues of affective psychology are apt to be left out of sight. It is easier and more exciting to criticize so-and-so's theory of pleasure-pain, than to face the problem of the affective qualities for oneself; and, indeed, theory has had so wide a range that one can hardly turn in any direction without being confronted by some so-and-so's speculations."

The causes that underlie this situation are indeed not hard to locate. On the one side lies the age-long obsession, itself highly colored with emotion, that we have no emotions—certainly not when we are decent human beings. The mainstay of our mental life is intellect, we have heard,—a sort of spiritual essence that rules over the unruly lower 'animal' desires. Man is, or should be at his best, according to this historic doctrine, a cold, calculating, rationalizing, speculative spirit. A few of the intellectual feelings, such as religious fervor, contrition, and neighborly love, might be cultivated, but with great care lest they go beyond bounds. On the other side lies the time-worn attitude that the individual's emotional life should be fortified within the innermost citadel of privacy. Traditionally, the intellectual activities of man are matters of the market-place. They may be examined,

praised, and condemned. His feelings, however, are his own private affair. Only his most intimate friends and relatives are privileged to penetrate the depths of his heart. Perhaps that is the reason why the entire inquisition of the intelligence tests has met with comparatively little resistance. When we come to tests of the emotional character of the individual there will probably be much more ado. For both reasons, too, we can comprehend this statement recently widely published in the press:

> "Men are tending toward an age of sobriety in which laughter will have no more real place than alcohol in the United States. In the sober period of scientific and social thought there may be museums which will preserve our jokes and comics the way we keep the memorials of the ancients."

On the other hand, from three specific directions comes the pressure to understand more fully the emotional life of mankind. In the first place, not only during great crises but also in the ordinary run of daily events we want knowledge about the strong elementary forces that sway human beings. During the war psychologists were commandeered to study the morale of the army and of the civil population behind the lines. They were active in providing proper outlets for the emotional responses of the various groups. Now many of these psychologists are studying the emotional nature of different races and nationals in order that their instinctive energies may be directed into channels which lead to a more efficient life rather than to a more effective death. In the next place, we find that our knowledge is sadly deficient when it comes to understanding the abnormal or diseased human mind. A distinguished psychiatrist said not long ago that the first chapter to which he invariably turned in a new text-book or systematic treatise of psychology was the chapter on emotion; but with what disappointment! One of the chief reasons why Freudianism has laid hold of the popular and professional imagination is because it offered a workable theory of the emotional life of the individual. The same thing can be said about the James-Lange-Sergi theory in its day and the glandular theory of today. Both the practitioner

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and the theoretical scientist are craving for facts on the subject. And lastly, we need more insight into the urge that motivates every-day action. It is something of the character of what Woodworth in his dynamic psychology calls the *drive*, what Bergson has made famous in the expression, *élan vital*, what Patrick has recently called the *will-to-live*, what educationalists have long called *interest*, *effort*, *conscientiousness*,[1] or confessedly an unknown but not an unknowable factor. There is something there which the intelligence tests have not yet measured. The will-profile test of Downey, the analysis of interest by Miner, the investigation of likes and dislikes by Woodworth, the 'cross-out' tests of emotional reactions by the Presseys, and the proposed analysis of character by Starbuck, are moving in the right direction. But fully reliable data in sufficient quantity for systematization are not yet at hand.

In view of this condition of affairs affective we would do well to fractionate the problem. We may all have been somewhat misled in following the double standard of pleasantness *and* unpleasantness. The present inquiry concerns the validity of the conjunction, 'and.' We must no longer take the coördination of pleasantness and unpleasantness for granted. For the present at least a concentrated attack is needed on either pleasantness *or* unpleasantness. Hence comes the uncoördinated title of the paper, the *psychology of pleasantness*. The reasons that prompt the proposal are set forth in detail in what follows.

We often thrust our concepts to the opposite ends of thought and then complacently settle down in the cleared space, benignly look out of the 'windows of our soul,' and only in indirect vision give heed to the litter on both sides. Thus have fared 'truth and falsehood,' 'good and bad,' 'beauty and ugliness,' 'capital and labor,' 'rich and poor,' and a long list of opposites. There seems to be no middle

[1] "It has long been surmised that feeling is the most important controlling factor in the learning process, and its function here has been questioned only because of a confused view of psychology in which the feelings were considered as a sort of 'purely mental' content, quite remote from the world of muscles, glands, and actions, and therefore having no means of influencing that world" (19, 322).

ground. Our phantom affective bark has a stem and a stern, but no midships! And so down the register of the affective life we find: 'pleasure and pain,' 'pleasure and displeasure,' 'pleasantness and unpleasantness,' 'pleasure and unpleasantness' and 'agreeableness and disagreeableness.' More than one psychologist has pointed out, of course, that these are not only opposite names, but opposite in the sense of incompatible experiences.[1] Few psychologists admit that the experiences may appear simultaneously in the form of mixed feelings.

These questions then follow:[2] (1) are the affective experiences opposites of a single quality; (2) are they the limits of a unidimensional system with uncounted qualities between the extremes; (3) are they members of different systems? A positive answer to the first would make sense in psychology if one experience were nothing more than the lack of the other. Pleasantness, for example, would then be the conscious absence of unpleasantness. This almost seems absurd beyond peradventure of doubt, but logically the question ought to be raised if for no other reason than to make an inventory of our affective assets. An affirmative reply to the second would mean, then, that these experiences are like the tint or brightness series in vision or like the series of colors between neighboring primary colors. Black and white, or red and yellow, are ends of a series of qualities. Wundt probably was the sole definite sponsor for this conception. His tridimensional scheme was crowded with affective qualities within the system and therefore between the poles. Royce

[1] From the point of view of terminology there may be some significance in the fact that in many languages the simpler feelings are expressed in terms of one another. Outside of the traditional 'pleasure' and 'pain,' all of our expressions involve correlations of pleasantness with its verbal opposite which is indicated by some form of negative prefix. It is noteworthy, too, that the negative is built around pleasantness as a standard.

[2] Beaunis many years ago raised similar questions when he said, "It may be that pleasure and pain, which seem to us two opposite and mutually contradictory phenomena of different orders, but phenomena of the same nature, only differing in degree. It is possible that they may be phenomena of different orders, but incapable of such comparison with one another as would enable us to declare one contrary to the other. It is possible that they may depend simply on a difference of excitability in the nervous centers. Again, it is possible that they may be included, sometimes in one category, sometimes in the other." (Quoted in 48, 49.)

approximated this description but not in detail. The main difficulty here lies with the indifference point midway between the two extremes. There is nothing comparable to this in the visual qualitative series. If the last question were positively answered, it would mean that we have a situation like warmth and cold, physically descriptive of a single series, but psychologically unrelated in experience.

To return to the methodological phase of the problem we ought to get away from our habit of saying 'heads and tails' and get to work on the 'head' or the 'tail' or any other part of the anatomy. We can then relate the member investigated to the rest of the structure when we know much more about it.[1]

With these logical misgivings in mind, certain other facts which have recently been referred to in the literature support the contention that we ought to rid ourselves henceforth of the implied opposite nature of pleasantness and unpleasantness. It is all very easily understood when we recall the tendency of the human mind to balance its concepts by relating one quality to its opposite. The query that is tentatively raised now is: May pleasantness and unpleasantness be qualities of different orders, not opposite in inherent nature but opposed only by verbal habit?

While in itself not conclusive but merely indicative, stands the fact that there is a difference in the temporal course and in the frequency of pleasantness as compared with unpleasantness in our daily lives. Were one to judge the comparative frequency by the number of books and articles that have appeared on the subjects of pleasure, with humor, comedy, and laughter as compared with the subjects of more or less opposite affective value, we would think that this were a very pleasant world and life one huge joke after another. From Cox's book on 'Why We Laugh,' published in the early '70's in this country **16**, and the articles by Hecker **27** and

[1] In doing this we are but repeating Nafe's tactics when he writes: "We thus planned a new frontal attack upon the psychology of affection; and the first thing to do, in working out a technique, was to study the methods of our predecessors. It seemed possible that the diversity of result and of opinion in affective psychology might be due, largely, to some single error of procedure,—to some very natural error that had been passed on, in varying degree, from investigator to investigator" (**46**, 507).

Kraepelin **35** appearing at about the same time abroad, down to the several serious studies **24**, **25**, **26**, **40** of the humorous attitude that appeared last year, the documentary evidence does not fail us. But we might be judging ourselves as Voltaire judged the English when he declared that a nation that had thirty different religions and only one sauce must be indeed in a very sad state of affairs!

In an experimental work undertaken by Washburn on the revived emotions, she found that joy, a pleasant emotion, is more intensely revived than either fear or anger; stating it differently, "revived anger falls away in intensity with time more rapidly than either joy or fear. Joy falls away least rapidly" (**64**, 101). She finds also that joy is more quickly recalled than either fear or anger; also that in the case of joy there is rather a marked tendency for the more intense revivals to be made quickly. Commenting on this, she says, "these conclusions would be in harmony with the often verified fact that *unpleasant experiences are recalled more slowly than pleasant experiences*" (**64**, 102).

In some questionary returns of our own from 173 women and 29 men who were asked to make a detailed analysis of any typical emotion, mood, passion, or sentiment in accordance with headings to be filled in on mimeographed sheets, we found among the women 24 per cent. of the experiences were pleasant, 58 per cent., unpleasant, and 18 per cent., varying from pleasant to unpleasant; among the men, 25 per cent. pleasant, 46 per cent. unpleasant, and 29 per cent. varying from pleasant to unpleasant. Averaging these results for both sexes, we find 24 per cent. pleasant, 52 per cent. unpleasant, and 24 per cent. varying from pleasant to unpleasant. In brief, there were more than twice as many unpleasant experiences selected for analysis by observers than pleasant ones. As a check on these results we asked a laboratory section of 24 advanced students to record all of their affective experiences each day for a week. The headings used were much simpler than those appearing on the mimeographed sheets, but one of them referred to the pleasant or unpleasant nature of the experience. The other headings

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were set down to conceal the purpose of the experiment. Altogether, 242 experiences were reported. Curiously enough, the relative frequency of pleasant and unpleasant experiences under this method was reversed. 60 per cent. were pleasant, 31 per cent. unpleasant, and 19 per cent. varied from pleasant to unpleasant. These conflicting results indicate perhaps the unsuitableness of the methods, but in either case there seemed to be a definite variation in the frequency of occurrence of pleasantness and unpleasantness. Bentley, in one of the latest introspective reports on dreams, found that affection was recorded in 41 cases out of 54 and of these 27 experiences were unpleasant, 14 were pleasant. The error of memory, it will be recalled, was cancelled by the procedure which required the observer to set down his analysis the moment that the alarm-signal awoke him from his dream (**6**, 203).

Not enough reliable data are available to show absolutely that pleasant experiences are more frequent than unpleasant or the reverse, but these citations may well lead us to question the distribution of pleasant affective qualities along the same line with unpleasant ones with an indifference point at the middle.[1] Almost all experimenters on affection with whom we have discussed this matter agree that it is much easier to produce an unpleasant affection or emotion in the laboratory than a pleasant one. In almost all cases the pleasant experiences will fall flat and the observer will be roundly entertained, but not thoroughly moved by supposedly pleasant situations. In going through the literature, one is struck by the preponderance of unpleasant emotions objectively recorded

[1] In a recent news dispatch some experiments by J. C. Flügel at the University of London have been reported. I have not been able to verify the results in any psychological journal. The report indicates that Flügel had nine men record their emotions for a month while they were leading a supposedly unpleasant life in the belief that they would find even under these conditions a preponderance of pleasure over displeasure. He found, so the report goes, that 68 per cent. of their feelings were pleasant, and 32 per cent. unpleasant. The "gloomiest man of the crowd was amazed to learn when he finally checked up, that he had been happy 40 per cent. of the time, unhappy 36 per cent. of the time, and 'on the fence' the rest of the month." Twenty-two main causes of pleasure and 24 cases for displeasure were found; food producing pleasure 6 per cent., 'tender emotions' being responsible for less than 1 per cent., and 'companionship and society' only a quarter of 1 per cent. Fatigue is the cause of 4 per cent., sorrow 1 per cent., embarrassment ½ of 1 per cent.

or introspectively analyzed. For many years we found this condition to be true in our own experiments. There is little or no difficulty in arousing a genuine fear, anger, disgust, embarrassment, and hate in the laboratory, but we have yet to find the means to create a real joy, love, pride, or happiness. In going over the emotional situations recently described by Landis (**36**, 458) we are impressed by the scarcity of pleasant stimuli. He says, "it was hoped that some stimulus for laughter, such as a joke, might be obtained but in this we were not successful, and so this situation was omitted after the first two subjects. Brunswick reports similar difficulty."

Another point of difference that is frequently brought out in experimentation is the difference in response. Of course, in the type of psychology that hopes to distinguish mental processes entirely on the basis of response, any definitely found variation in response would itself be sufficient to describe the inherent nature of process. For those of us, who still take introspection into account but are quite willing also to observe bodily reaction, uniform variations of bodily activity serve as a check on introspectively found data.

Almost all of the discussions of affective experience have emphasized in one way or another the significance of bodily processes.[1] Feldman (**21**, 304) has recently called attention to a very interesting historical passage found in the Babylonian Talmud written about 500 A.D. but containing proverbs collected as early as 250 B.C. which runs as follows. The story concerns Vespasian who is talking with Rabbi Johanan ben Zakkai.

[1] In this connection, as in many others, an historical perspective of the subject is not only valuable but necessary. An apt restatement of this homely truth occurs in Mateer's new book, 'The Unstable Child,' which is worth quoting here:

> "No new development in any field is properly understood unless one views it in the light of that from which it has grown. Only by keeping a perspective which relates the old to the new and, contrariwise, builds the new out of the old, can we properly evaluate, criticize, reject or accept the new aspects of any movement. Psychological developments exhibit no exception to this need" (**44**, 3).

We therefore offer no apology for indicating the systematically unstable position which affective processes have held in the history of psychology. The only apology that we feel inclined to make would apply to the necessary brevity in the presentation of this historical fact.

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> "In the meantime there came to him a messenger from Rome and spake to him saying: 'Up, for the Cæsar is dead, and the nobles of Rome have agreed together to choose thee for their Cæsar.' Now he had at that time drawn on one of his shoes, and was in the act to draw on the other, yet would not his foot pass therein; then he set himself to pull off that which he had drawn on, but it clave to his foot. Thereupon spake Johanan to him and said: 'Be not disquieted! Thou hast received good tidings, and it is written: a good report maketh the bones fat.' 'What, then,' said he, 'must I do?' And he said: 'Make to pass before thee some man that thou hatest; for it is written: a broken spirit drieth the bones.' Then he did as Johanan had counselled, and his foot passed into his shoe."

This was a long time before the Wundtian formula of a strengthened and retarded pulse as a concomittant of pleasurable emotion and the reverse of these characteristics for unpleasantness! But of course the Greek and Roman writers were always locating their emotions within the body walls. Later in the middle of the seventeenth century Spinoza, writing in Latin, took a novel step. A pleasurable emotion is not just the movement of some part of the body, but the concept of that modification. In the translation of Spinoza's words:

> "Hence it follows that there is no emotion, whereof we cannot form some clear and distinct conception. For an emotion is the idea of a modification of the body (by the general definition of the emotions) and must therefore (by the preceding proposition) involve some clear and distinct conception."

Other writers of the time, like Descartes and Malebranche, said similar things, each in conformity with his own system of thought. Several centuries later James was criticized for saying that "*our feeling of the same* [bodily] *changes as they occur IS the emotion,*" and again that "*if we fancy some strong emotion, and then try to abstract from our consciousness of it all the feelings of its bodily symptoms, we find we have nothing left behind*" (**30**, II, 449, 451). He then partially retracted his argument and chided his readers for taking him so seriously.

For the experience of pleasure and displeasure was itself an undeniable accompaniment! This view, however, is contradicted by Watson, who says,

> "An emotion is an hereditary 'pattern-reaction' involving profound changes of the bodily mechanism as a whole, but particularly of the visceral and glandular systems" (**65**, 215).

That is definite enough and is, of course, to be expected of the behavioristic doctrine in its extreme form.

There are also those who support the introspective procedures but who are for the time being concerned with the variable organic responses of pleasant and unpleasant affective states. We turn to Washburn, who has made a questionary study of certain national differences in emotional traits. Results were obtained from female Russian Jews, Italians, and Poles. It was found that these groups of different nationalities differ most among themselves in regard to sources of pleasure, less in regard to sources of fear, and least in regard to sources of anger. "This result," she says, "is perhaps the most interesting one of the study" (**65**, 418). Commenting on this, she believes that custom and tradition determine to a large extent our sources of pleasure, but that we do not have to learn what to get angry at. Summarizing, she believes that pleasure is determined by more than one innate tendency. In some recent studies on organic responses, we find according to Brunswick (**10**, 270–286) that the tonicity of the gastrointestinal tract is inhibited with unpleasant emotions and normally facilitated with pleasant ones. With unpleasant emotions, however, there may occasionally be no changes in tonus or contractions in place of inhibitions; but with pleasant emotions no exceptions to the rule are noted. Marston theorizes (**43**, 496–505) on the basis of systolic blood pressure when he states that "the passing of any subminimal sensory impulse to unimpeded motor discharge, over any thalamic nerve path correlated with consciousness, is accompanied by the feeling of pleasantness," whereas, "unpleasantness is correlated with unrelieved, thalamic summation of sensory impulses, in the sensory circuits of the unsuccessful competing impulses."

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In a recent controversy between Young **70** and Corwin **15** the character and direction of overt movements have been discussed. In his earlier study, (**69**, 51–52) Young found that "With unpleasantness there are withdrawing movements, frowning, straining, reflexes of expulsion, etc., while pleasantness is characterized by mere acceptance of the situation and the passive yielding to it . . . . Pleasantness is felt when one relaxes, or simply 'does nothing.'" Corwin criticized his procedure and modified the experimental condition so that the observer must make seeking movements if he desires to retain a pleasanter tone sensation. As the result of her experiments she obtained movements of pursuit with pleasant stimuli but no exact correlation was obtained with pleasant feeling, nor was avoidance definitely correlated with unpleasantness because negative instances did not appear to be sufficiently taken into account. Young repeated this experiment under more favorable conditions in which the pleasant stimulus was placed far enough away so that the observer could make forward or seeking movements as well as detracting movements. The results of this series are still somewhat in doubt. The author states (**70**, 519–525) that there may be movements of approach if the stimuli are sounds which are becoming intensively weaker, but he does not "find satisfactory evidence of seeking movements which are involuntary expressions of pleasantness." He inclines to interpret the results in terms of attention or to an incentive. His last conclusion points to the traditional interpretation of seeking the avoiding movements as teleological descriptions of behavior and recommends that the historical "hedonistic doctrine be abandoned and that psychologists study directly the facts of response and of affective psychology." It is clear, however, that the type and direction of response, on whatever basis it may be explained, show an inherent difference between the pleasant affective experience and the unpleasant affective experience.

In quite another way, Allport (**2**, 84–90) has approached the problem when he shows that there are two introspective aspects of the emotional consciousness: (1) an affective

element of pleasantness or unpleasantness, and (2) a distinctive quality of the emotion which differentiates it from other emotions of like affective quality. On the basis of physiological studies made by Cannon **13**, he points out that in most emotions of pleasant affectivity the sacral and cranial divisions of the autonomic nervous system function in the stimulation of those organs, especially of digestion and sex, with which these divisions are connected. The unpleasantly toned emotions are correlated with inhibitions in the functioning of these organs through the sympathetic division of the autonomic system. Summarizing his theory he says, ". . . Finding a certain physiological process to be present in the entire group of unpleasant emotions, and an antagonistic process common to pleasant emotions, we infer that these processes form the basis of conscious unpleasantness and pleasantness respectively. *The craniosacral division of the autonomic, supplemented under certain conditions by the cerebrospinal system, innervates those responses whose return afferent impulses are associated with the conscious quality of pleasantness. The sympathetic division produces visceral responses which are represented in consciousness as unpleasantness.*"

What of the introspective analyzers of mental processes? The earlier structural and functional approaches furnished us with curious inconsistencies. Brentano, Stumpf, Stout, and Irons have contended that pleasantness is generally sensory in character: it is nothing more than a light tickle, itch, motor or organic reaction, or sex-feeling. In other words, for the sake of simplicity as well as in accordance with introspective analysis, there is for Stumpf no additional mental element, the simple feeling, one of whose qualities is pleasantness. In the first four editions of Wundt's major work, that is up to 1893, the affective value of pleasantness was an attribute of sensation and not a separate mental element. Meeting Külpe's unanswerable attacks Wundt three years later in his 'Grundriss' took the position which he maintained with Lipps, Ebbinghaus, Külpe, Stout, and most of the American psychologists to the present day, that it is a distinctly separate

element. Ribot describes it as one of two elemental experiences, antecedent even to sensation. But even here a cycle is beginning to be visible; Wundt, Külpe, and Ebbinghaus are dead; but from the Cornell laboratory observers are reporting that pleasantness is reducible to modes of pressure sensation.

This fundamental issue has been raised by Nafe in some recent thoroughgoing experimentation on the affective qualities. Those who are familiar with the historical positions which affection has held down the decades in systematic psychology will probably be as surprised, as the experimenter himself was, to learn that the exponents of affection as an elementary mental process may have to revise seriously their classification. We read (**46**, 543–544) "Sensory experience may or may not also be affective; it may be characterized as pleasant or unpleasant or neither. If sensory experience becomes pleasant or unpleasant, it alters as a whole; something is added to it that is not present while it remains indifferent. Qualitatively, this increment, in the case of a pleasant experience, is bright pressure or a touch-quality lying between bright pressure and tickle; in the case of an unpleasant experience, the increment is dull pressure or a quality lying near dull pressure." Our own hypothesis that pleasantness and unpleasantness are of different orders receives a temporary setback in his conclusion that they "are inherently alike, as if made from the same matrix; their differences are of the sort that occur within one and the same modality." But, as the experimenter himself admits, the results "must . . . first be tested by other experimenters; and many questions of affective psychology which our investigation does not touch must first be asked and answered." We note, as the experimenter also admits (**46**, 508) that the reports had to do with weakly-toned affective experiences. It remains to be seen whether in attempting to avoid overshooting the mark, the experimenter has not undershot it. In other words, there is doubt that a typical affective experience was analyzed in these reports.

Of those who have lately written text-books largely from

the introspective point of view we find Woodworth saying that the simple feelings of pleasantness and unpleasantness are so far unanalyzed, that they belong to the background or 'undercurrent of consciousness,' that they lack the cognitive aspect, but that they may lend a sort of characteristic 'tone' to other mental processes (**68**, 172–174). Seashore gives heed to the frequent description of affective processes as elemental, but states that the issue is not easily settled. He raises the question, however, as to whether a cognitive element may not be implied when the affection becomes a feeling-tone of a cognitive process (**52**, 308). In another recent text-book Moore furnishes us with an excellent discussion of the affective life. He concludes with the opinion that "we have a number of 'simple' feelings." While the exact number of these is unknown, he inclines to the view that we should go even beyond the Wundtian tridimensional scheme and expect as many different affective processes as there are emotions (**45**, 106). Dunlap finds it still to be a datum of experience with twenty-five other feelings, but thinks that a plausible basis for it is in the tumescence of the generative organs (**19**, 316). Wells in his new book on 'Pleasure and Behavior' is safe when he says, "And so it looks just now as if the whole question of the ultimate nature of pleasantness were before us for review" **67**.

Warren (**63**, 279) presents a theory of feeling which is novel in that the affective states are complexes of systemic sensations—especially those of *general sensibility*. These sensations report neither objects external to the body nor movements of the body as a whole or any of its parts: they report the state or welfare of the organism itself. Their specific qualities become less distinct and are characterized by a general hedonic tone. When the dominant hedonic tone is pleasant, the feeling becomes an appetite, when the dominant hedonic tone is unpleasant, the feeling is an aversion; and when the hedonic tone is indefinite, the resultant feeling is excitement. Systematically, it is difficult to understand how a feeling whose components are systemic sensations can have qualitative attributes of a different modality from

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those of the systemic sensations themselves. Presumably, the systemic sensations are distinguishable neither by their hedonic tone nor by their reference to bodily welfare. They must have qualities of their own. It is not clear what then is the relationship of the hedonic tone to the intrinsic qualities of the systemic sensations.

In fine, while we are bent on determining whether or not pleasantness and unpleasantness are different modalities, we should not overlook the possibility of establishing their basic nature. Are they to remain qualities of a simple mental process akin to sensation and image, but with several peculiarities and reservations; or are they to find a place among the qualities or attributes of other mental processes? The whole question of the relation between affection and other mental processes is again in order for discussion.

A final urge comes to us from the discussions of so-called introspective and behavioristic types of psychology. It may well be that the refinements of physiological and biological technique afford us a new approach to the problem of pleasantness and unpleasantness. An introspective description, coming as it does from a mind obsessed with logical contrasts, saturated with previous instruction, and biased with the every-day habit of talking in pairs, may well have introduced an error in correlating pleasantness with unpleasantness. Certainly physical and chemical procedures are freer from misunderstandings of this sort and may lead to more clear-cut distinctions between these experiences. We must not forget, however, that introspective accounts should run parallel with bodily response. More than one experimenter in affections and emotions has stated that the affective response to a given stimulus can never be predicted in an observer. Stimuli that for most individuals would be unpleasant many times turn out to be pleasant. And the reverse is almost as frequently found.

Summarizing, we lay down the following suggestions in favor of studying pleasantly toned experiences apart from unpleasantly toned experiences.

1. The opposition between these qualities is probably logical and not psychological.

2. The two qualities occur with unequal frequency both in every-day life and in laboratory experimentation.

3. In terms of response, there appear to be (*a*) no true opposite movements for pleasantness and unpleasantness, nor (*b*) definitely correlated neural centers.

4. The relation between affection and sensation must be studied anew and according to several authorities the time is opportune for a new approach to this problem.

5. The newer technique of behavioristic responses furnishes us with an instrument which is free of logical bias in the description of affective states; but introspective accounts must still be obtained in connection with these bodily effects.

BIBLIOGRAPHY[1]

1. ALLPORT, F. H., 'A Physiological-Genetic Theory of Feeling and Emotion,' PSYCHOL. REV., **29**, 1922, 132–139.
2. ALLPORT, F. H., 'Social Psychology.' N. Y., 1924.
3. ANGELL, J. R., 'Psychology.' (4th rev. ed.) N. Y., 1908.
4. AUDIBERT, A. C. M., 'Étude sur la physionomie.' Bordeaux, 1892–3.
5. BEAUNIS, H., 'Les sensationes internes.' Paris, 1889.
6. BENTLEY, M., 'The Study of Dreams,' *Amer. J. Psychol.*, **26**, 1915, 196–210.
7. BENTLEY, M., 'A Note on the 'Expression' of Simple Feelings,' PSYCHOL. REV., **30**, 1923, 326–327.
8. BORING, E. G., AND TITCHENER, E. B., 'A Model for the Demonstration of Facial Expression,' *Amer. J. Psychol.*, **34**, 1923, 471–485.
9. BRIDGES, J. W., 'Theories of Temperament,' PSYCHOL. REV., **30**, 1923, 36–44.
10. BRUNSWICK, D., 'The Effects of Emotional Stimuli on the Gastrointestinal Tone,' *J. Comp. Psychol.*, **4**, 1924, 19–79; 225–287.
11. BUZBY, D. E., 'The Interpretation of Facial Expression,' *Amer. J. Psychol.*, **35**, 1924, 602–604.
12. CALKINS, M. W., 'A First Book in Psychology.' (4th rev. ed.) N. Y., 1914.
13. CANNON, W. B., 'Bodily Changes in Pain, Hunger, Fear, and Rage.' N. Y., 1915.
14. CANNON, W. B., 'What Strong Emotions Do to Us,' *Harp. Mag.*, **145**, 1922, 234–241.
15. CORWIN, G. H., 'The Involuntary Response to Pleasantness,' *Amer. J. Psychol.*, **32**, 1921, 563–570.
16. COX, S. S., 'Why We Laugh.' N. Y., 1876.
17. CRILE, G. W., 'The Origin and Nature of the Emotions.' Philadelphia, 1915.
18. DARWIN, C., 'Expression of the Emotions in Man and Animals.' London, 1873.
19. DUNLAP, K., 'Elements of Scientific Psychology.' St. Louis, 1922.
20. EASTMAN, M., 'The Sense of Humor.' N. Y., 1921.

[1] This is, of course, far from a complete bibliography. It represents a collection of titles of significant references, most of which were consulted in the preparation of the paper.

XUM

21. FELDMAN, S., 'Experimental Psychology in the Talmud,' *Amer. J. Psychol.*, **33**, 1922, 304.
22. FELEKY, A. M., 'Expression of Emotions,' PSYCHOL. REV., **21**, 1914, 33–41.
23. GATES, A. I., 'Psychology for Students of Education.' N. Y., 1923.
24. GREIG, J. V. T., 'The Psychology of Laughter and Comedy.' N. Y., 1923.
25. GREGORY, J. C., 'The Nature of Laughter,' *Psyche*, **4**, 1923, 150–167.
26. GREGORY, J. C., 'Some Theories of Laughter,' *Mind*, **32**, 1923, 328–344.
27. HECKER, E., 'Physiologie und Psychologie des Lachens und des Komischen.' Berlin, 1873.
28. IRONS, D., 'The Nature of Emotion,' *Phil. Rev.*, **6**, 1897, 242–256; 471–496.
29. IRONS, D., 'The Primary Emotions,' *ibid.*, 626–645.
30. JAMES, W., 'Principles of Psychology.' 2 vols. N. Y., 1890.
31. JUNGMANN, J., 'Das Gemüth.' Freiburg, 1885.
32. KANTOR, J. R., 'An Attempt toward a Naturalistic Description of Emotions,' PSYCHOL. REV., **28**, 1921, 19–42; 120–140.
33. KANTOR, J. R., 'The Psychology of Feeling or Affective Reactions,' *Amer. J. Psychol.*, **34**, 1923, 433–463.
34. KELCHNER, M., 'Sammelreferat über den gegenwärtigen Stand der Erörterung einiger Grundprobleme der Gefühlspsychologie,' *Arch. f. d. ges. Psychol.*, **18**, 1910, (Literaturbericht), 97–164.
35. KRAEPELIN, E., 'Zur Psychologie des Komischen,' *Phil. Stud.*, **2**, 1885, 128–160; 327–361.
36. LANDIS, C., 'Studies of Emotional Reactions,' Pt. I, J. EXPER. PSYCHOL., **7**, 1924, 325–341; Pt. II, *J. Comp. Psychol.*, **4**, 1924, 447–501.
37. LANGFELD, H. S., 'Judgments of Emotions from Facial Expressions,' *J. Abn. Psychol.*, **13**, 1918, 172–184.
38. LANGFELD, H. S., 'Judgment of Facial Expression and Suggestion,' PSYCHOL. REV., **25**, 1918, 448–494.
39. LIPPS, T., 'Komik und Humor; eine psychologischästhetische Untersuchung.' Hamburg und Leipzig, 1898.
40. MCCOMAS, H. C., 'The Origin of Laughter,' PSYCHOL. REV., **30**, 1923, 45–55.
41. MCDOUGALL, W., 'An Introduction to Social Psychology.' Boston, 1917.
42. MARSHALL, H. R., 'Pain, Pleasure, and Esthetics: an Essay Concerning the Psychology of Pain and Pleasure, with Special Reference to Esthetics.' London, 1894.
43. MARSTON, W. M., 'A Theory of Emotions and Affection Based upon Systolic Blood Pressure Studies, *Amer. J. Psychol.*, **35**, 1924, 469–506.
44. MATEER, F., 'The Unstable Child,' N. Y., 1924.
45. MOORE, T. V., 'Dynamic Psychology.' Phila., 1924.
46. NAFE, J. P., 'An Experimental Study of the Affective Qualities,' *Amer. J. Psychol.*, **35**, 1924, 507–544.
47. PRESSEY, S. L., AND L. W., "Cross-out' Tests, with Suggestions as to a Group Scale of the Emotions,' *J. Appl. Psychol.*, **3**, 1919, 138–150.
48. RIBOT, T., 'The Psychology of the Emotions.' London and N. Y., 1897.
49. RUCKMICK, C. A., 'A Preliminary Study of the Emotions,' PSYCHOL. MONOG., **30**, 1922, No. 3, 30–35.
50. RUDOLPH, H., 'Der Ausdruck der Gemütsbewegungen des Menschen.' (2 vols.) Dresden, 1903.
51. SCHAUER, O., 'Über das Wesen der Komik,' *Arch. f. d. ges. Psychol.*, **18**, 1910, 411–427.

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52. SEASHORE, C. E., 'Introduction to Psychology.' N. Y., 1924.
53. SIDIS, B., 'The Psychology of Laughter.' N. Y. and London, 1913.
54. SMITH, W. W., 'The Measurement of Emotion.' N. Y., 1922.
55. STANLEY, H. M., 'Studies in the Evolutionary Psychology of Feeling.' London and N. Y., 1895.
56. STOUT, G. F., 'A Manual of Psychology.' N. Y., 1907.
57. STRATTON, G. M., 'Anger: Its Religious and Moral Significance,' N. Y., 1923.
58. STUMPF, C., 'Über Gefühlsempfindungen,' *Zsch. f. Psychol.*, **44**, 1907, 1–49.
59. SULLY, J., 'An Essay on Laughter.' N. Y., 1902.
60. TITCHENER, E. B., 'Experimental Psychology,' (Vol. I, Pt. II), N. Y., 1910.
61. TITCHENER, E. B., 'Text-book of Psychology,' N. Y., 1919.
62. TOLMAN, E. C., 'A Behavioristic Account of the Emotions,' PSYCHOL. REV., **30**, 1923, 217–227.
63. WARREN, H. C., 'Human Psychology.' Boston, 1919.
64. WASHBURN, M. F., FIELD, R., AND WOLF, E. D., 'A Study of Revived Emotions,' *Amer. J. Psychol.*, **34**, 1923, 99–103.
65. WASHBURN, M. F., 'A Questionary Study of Certain National Differences in Emotional Traits,' *J. Comp. Psychol.*, **3**, 1923, 413–430.
66. WATSON, J. B., 'Psychology from the Standpoint of a Behaviorist.' (2d ed.) N. Y., 1924.
67. WELLS, F. L., 'Pleasure and Behavior.' N. Y., 1924.
68. WOODWORTH, R. S., 'Psychology.' N. Y., 1921.
69. YOUNG, P. T., 'Pleasantness and Unpleasantness in Relation to Organic Response,' *Amer. J. Psychol.*, **32**, 1921, 38–53.
70. YOUNG, P. T., 'Movements of Pursuit and Avoidance as Expressions of Simple Feeling,' *Amer. J. Psychol.*, **33**, 1922, 511–525.
71. YOUNG, P. T., 'Constancy of Affective Judgment to Odors,' J. EXPER. PSYCHOL., **6**, 1923, 182–191.

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THE PLACE OF LANGUAGE HABITS IN A BEHAVIORISTIC EXPLANATION OF CONSCIOUSNESS

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Behaviorism represents a reaction against unscientific psychology. It has attempted to substitute real information for such concepts as consciousness, sensation, imagery, and similar terms. It decries the use of verbalism as a cover for ignorance. It has boldly questioned the fetishes of psychology. A so-called unique field of consciousness has been a particular battle-ground which the older psychologists and philosophers have held tenaciously. The difficulty is not so much that the behaviorist attempts to deny facts of experience, as that the behaviorist demands the privilege of bringing consciousness out of vitalistic philosophy into a mechanistic science. I suppose that this has been the general method of advance in scientific knowledge. The field of philosophy must give way with the enlargement of the realm of science. Behaviorism is an attempt to extend the realm of science to include the so-called unique facts of consciousness. If some have gone so far as to deny facts of experience, this is a mistake which does not represent the real scientific spirit of behaviorism.

As it is the purpose of this paper to show, at least partially, to what extent language habits and the language mechanisms may be used to give a behavioristic and mechanistic explanation of consciousness, it might be well to state some of the major attitudes or views in regard to behaviorism and consciousness.[1]

There are those who advocate two distinct sciences, one

[1] *Vide* Woodworth, 'Four Varieties of Behaviorism,' Proc. Amer. Psychol. Assn., PSYCHOL. BULL., **21**, p. 89; also Lashley, K. S., 'A Behavioristic Interpretation of Consciousness,' PSYCHOL. REV., **30**, pp. 238–40.

for the study of introspection and consciousness and the other for the study of behavior. S. W. Fernberger advocates this view.[1] Bechterew holds that facts of consciousness may be treated separately from behavior. Some merely insist upon the value, or perhaps superior value, of behavior study. Others insist upon the rejection of introspection and facts of consciousness as unsuited to scientific treatment.

From the standpoint of behavior, the above views sidestep the issue in regard to consciousness. The view in which we are particularly interested faces the problem. The conception is that mind is behavior. This is Lashley's view. The supposedly unique facts of consciousness do not exist. Watson also holds this view. Under it may be placed such conceptions of behavior as a neuromechanistic explanation, on the one hand, and of behavior, in the sense of social conduct, on the other.

Lashley, Warren, and Watson, to a certain extent, might be cited as examples of those holding to a rather strict neuromechanistic explanation. Warren's proposition is that both the introspectionist and the behaviorist have a common ground in the neurological explanation. Consequently, he puts considerable emphasis upon this neurophysiological study, indicating that the two systems, introspection and behaviorism, are but two aspects of common phenomena.[2] This has characteristics of the 'two-aspect' view. He suggests three methods: self observation, the neurological, and the behavioristic.[3] Lashley would hardly be as charitable toward the introspectionist. He would define behavior in a broader sense as the science of the physiology of reaction to stimulation.[4]

On the other hand, Weiss, for example, puts particular emphasis upon the 'biosocial' response or social conduct as the important aspect of behavior. Lashley suggests a compromise between the two extremes.[5] However, it should be

[1] Fernberger, S. W., 'Behavior versus Introspection,' PSYCHOL. REV., **29**, p. 411.
[2] Warren, H. C., 'Psychology and the Central Nervous System.' PSYCHOL. REV., **28**, p. 267.
[3] *Ibid.*, p. 268.
[4] Lashley, K. S., 'A Behavioristic Explanation,' p. 271.
[5] *Ibid.*, p. 351.

stated that Weiss expresses the desirability of explaining finally in physical and chemical terms and Lashley's compromise would be decidedly on the side of the neurological.

With this brief statement as to the behavioristic positions and the viewpoint of this paper, I wish to go on to the consideration of the language habits as a type of behavior and an explanation of consciousness.

Lashley has made one of the best statements for consciousness as a type of behavior. He is definite in his stand on mental phenomena. He states that "Mind is behavior and nothing else." [1] He indicates the importance of the language habits and the language mechanisms in consciousness. His statement of consciousness is, "The conception of consciousness here advanced is . . . that of a complex integration and succession of bodily activities which are closely related to or involve the verbal and gestural mechanisms and hence most frequently come to social expression." [2] And later he says, "The core of 'conscious' integration is the verbogestural coördination." [3] Watson also puts emphasis upon language habits in explaining imagery and consciousness.

In order to understand the significance of the verbogestural coördinations, an explanation of the development of language habits is essential.

The language habit is complete when the word-stimulus or language symbol becomes a substitute for a bodily habit and an absent stimulus.[4] The child begins with sounds that have an instinctive basis. The first vocal habits depend upon the language and sounds which surround him. A considerable number of these vocal habits may be established as conditioned reflexes or conditioned responses, the 'parrot stage,' without the child having yet developed true language habits. So far there is no difference in this respect between the child and other animals; for example, the dog that barks or 'speaks' for his food. It is not until these vocal habits become associated with appropriate bodily habits or substi-

[1] Lashley, K. S., 'A Behavioristic Explanation,' p. 240.
[2] *Ibid.*, p. 341.
[3] *Ibid.*, p. 342.
[4] Watson, 'Behavior,' 1914, p. 330.

tutable for them, that they begin to be language habits. The child begins to say 'box' when it is handed to him, 'open box' when he opens it, 'mik' when he gets his bottle, et cetera. The vocal habits become a substitute for the actual bodily or mechanical process. This is the beginning of language habits. Then, when these vocal habits become also a substitute for an absent stimulus-object, the true language habit is developed.[1] For example, the vocal habit 'box,' which is symbolic of or a substitute for the bodily habit of getting the box when the box is present, also becomes a substitute for or symbolic of the box when it is not at hand. The child can actually use the substitute stimulus 'box' in place of the box itself and 'pretend' or 'act' as if it were present. Of course, these processes go on together.

In the above explanation we have used vocal habits almost exclusively. This was for the purpose of making the explanation clearer. This should now be amplified by stating that language habits have a much larger range than vocal gestures and speech reactions. They include gestures of the hands, face, shoulders; signs; symbols of various kinds, and a large number of acts which fulfill the substitutive or symbolic character necessary in language. Our whole body comes to be part of the language mechanism. Watson believes, however, that language habits with their locus in the bodily musculature develop after the vocal language has been formed.[2] Mead also holds a similar view. He states that "there is every reason to doubt" that consciousness of self would have arisen if man had not had the mechanism of talking to himself.[3] More will be said later in regard to this speech mechanism. The statement is similar in intent to that of Watson. Consciousness, as used in some recent and earlier writings, carries this meaning of self-consciousness. It appears to have this meaning when it is used to describe characteristics which are supposed to be peculiar to man. We are not quite sure, however, that they

[1] Watson, 'Behavior,' 1914, pp. 328–31, for a fuller statement.

[2] *Ibid.*, pp. 332 *f.*

[3] Mead, G. H., 'The Mechanism of Social Consciousness,' *J. Phil., Psychol. & Sci. Meth.*, **9**, p. 405.

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are peculiar to man, although this will hold in general, and still less sure that they will remain so.

It might be well to state that self-consciousness appears to be inherent in the substitutive character of language habits. The language habit is a substitute for or symbolic of processes in the individual. It is also a substitute for or symbolic of absent stimuli which have a relation to the individual. Thus, the language habit at once designates the 'self' in contrast to 'others.' Hence the concepts of 'self' and 'others' develop as a particular type of behavior. In other words, it appears that any organism which develops language habits gets thereby a 'self' and an 'other' consciousness; i.e. a 'consciousness' of self and of others. The *facts* and *processes* would exist whether they were called 'self' and 'other' consciousness or by some other names. This might not seem to be the case with some early or more or less sporadic expressions of language habits, still the processes and facts are present. The above would hold true whether the absent stimulus is produced by a person or another object, although it is probable that language habits would not have been realized without the association of objects which were so similar that the individual could stimulate himself to make the same response that the object itself called out. Other individuals, the vocal mechanism, and the ear fulfil this requirement.

If the above explanation is correct, language habits mark one of the distinguishing features which differentiates man from the other animals. Not that it is a difference of kind particularly, but a difference of degree. This evidently accounts for Watson's stand that language habits represent the dividing line between man and other animals. He says, "So far no language habits have ever been found in animals, nor has any one succeeded in developing such habits in them." [1]

There are experiments, however, on delayed reaction which point to the possibility of the development of language habits in other animals. Most of these experiments are

[1] Watson, 'Behavior,' p. 321. Also pp. 318–22.

questioned, however, as to their reliability and method, so that they cannot as yet be accepted. Still this question must remain open until there is further, careful experimentation in this field.[1]

Language habits are built up after the child has considerable manual organization. Language habits begin to be associated with most or practically all of the manual habits after the child is about three years of age,[2] and these first language habits are explicit and get motor expression. If we assume that language is the basis of memory, this assumption would explain why the young child so seldom remembers the first two or three years of his life. Watson cites the case of Baby B, 2 years and 3 months of age, having no memory of the nursing bottle. Baby B acted as if it were a new bottle when it was presented.[3] He states that there are two organizations without verbal parallels. (1) Organization in infancy. This would indicate that the Freudians are in error as to 'memory' before about three years of age.[4] The age, of course, would vary somewhat with different children. However, it appears that these manual habits without language organization could furnish a basis for 'unconscious' habit twists and character formation. (2) Organization in the emotional field throughout life. Social life does not demand so much organization in this field. This may be the reason for so many of our emotional complexes, i.e. they do not have adequate expression and adaptation to the environment, there is little conscious organization of them. The later manual organization, i.e. after the first few years, has a parallel language organization and hence a 'conscious' or thought organization. The case is illustrated, for example, by the person learning to play golf. He tells himself how to stand, how to hold the club, to watch the ball, etc. Some of this motor thought apparently becomes centrally con-

[1] Hunter has made experiments with the raccoon. Experiments on the dog and the chimpanzee have been carried out by Walton and Köhler respectively.

[2] Watson, J. B., 'The Unverbalized in Human Behavior,' PSYCHOL. REV., 31, p. 273 *f.*

[3] *Ibid.*, p. 277.

[4] *Ibid.*, p. 275 *f.*

nected and short-circuited, but just how this takes place we are not sure.

So far an attempt has been made to show briefly how the language habits develop in a behavioristic and mechanistic manner. Of course, the important point is, Can consciousness be identified with language habits? It should in general be apparent that language habits furnish the basis for imagery, reasoning, and thought. It would be better to say that they are the essence of thought, and in so far as thought is identified with consciousness and awareness, language habits would constitute consciousness and awareness. But the rest of the paper must deal with this question.

Silent talking, according to Watson, is thinking. We think only in words or word substitutes, that is, reflexes of the second or a higher order—gestures, etc. These are so closely bound up with the emotional and manual organization that "when the individual is thinking *the whole of his bodily organization is at work*." [1] However, Watson concludes that 'thinking' is largely subvocal talking although it can occur without words.[2] Thinking, then, depends almost wholly, if not altogether, upon motor expression, according to this view.

This seems, however, to be an over-simplification in some ways and an over-complication in other ways. Lashley states that the weight of evidence seems definitely against the hypothesis which makes every action take motor expression at once and which looks upon thought as a succession of completed reflexes.[3] This latter would be the case if we accepted fully Watson's hypothesis. For some thinking there is probably a central chain of neural activity which activates efferent neurons only when the latter are facilitated by tonic innervation.[4] Miss Agnes Thorson of the University of Minnesota has also come to the conclusion from her studies on this subject that thinking may take place

[1] Watson, 'The Place of Kinesthetic, Visceral, and Laryngeal Organization in Thinking,' PSYCHOL. REV., 31, p. 341.

[2] *Ibid.*, p. 347.

[3] Lashley, 'A Behavioristic Explanation.' Footnote, p. 333. Also for a discussion of internal organization see Bernard, L. L., 'Instinct,' 1924, Ch. V, and his article, 'Neuropsychic Technique,' PSYCHOL. REV., 30, pp. 407–37.

[4] Lashley, 'A Behavioristic Explanation.' Footnote, p. 332.

without necessarily involving the tongue movements.[1] It appears that we must accept the hypothesis, at least as a working basis, that in thinking there is some shunting across centrally, that motor activity may drop out for a time and thought be sustained by central shortcuts and connections. Of course, this does not do away with the mechanistic and behavioristic nature of thought. It means that our problem of observation is more complicated, however. Neither does it, perforce, mean that thought takes place without first building up language habits that are motor and overt.

It is also a mistake to suppose that the only stimulus to thought is in the external world. Objects, and external factors, of course, play a large rôle in stimulating thought. Probably they play by far the larger rôle. Still, it appears that tissue changes,[2] neural changes,[3] and glandular activity may also stimulate or set up thought processes.

The line of discussion so far has identified consciousness very closely with the language habits. Hunter might seem to disagree with this. He defines consciousness as the irreversible relationship *SP-LR*.[4] That is, a sensory process and a language response. Of course, the *LR* may be the first item in a new *SP-LR* relationship. This concept appears to be valid. However, there seems to be no reason for assuming that this is in opposition to the discussion already given. It makes clearer the nature of language habits. It reinforces the concept of the vital connection between stimulus and response. It is an irreversible situation, based upon the inseparable relation of stimulus and response. It emphasizes the fact that language habits are based upon processes already at work. The language habits define these processes. Without the processes there would be no language habit as there would be nothing to define. Still, we may have sensory processes which are not defined by language habits. They may be defined by immediate motor acts or central changes.

[1] J. Exper. Psychol., **8**, 1925.

[2] Watson, *ibid.*, p. 340.

[3] Hunter, W. S., 'The Problem of Consciousness.' Psychol. Rev., **31**, p. 7.

[4] *Ibid.*, p. 11. Also Hunter, 'The Nature of Consciousness,' Program of the American Psychological Association, Psychol. Bull., **21**, p. 86.

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However, when they are not defined by language, consciousness apparently is not present. So, while it is possible that language habits are not wholly identifiable with consciousness, still, consciousness, it appears, does not arise until we do have language habits, and thus consciousness might after all be identifiable with the language habits.

I suppose that there are three solutions for this problem raised by Hunter's conception. (1) Language response may be just a phase of language habits and the language mechanism, and language habits, used in a broader sense, could include the material of consciousness. (2) The definition of consciousness may be too broad. (3) Consciousness may include other processes than those involved in the language mechanisms. To the degree that this is merely a matter of definition, we are interested only to the extent that it makes expression clearer. From this standpoint it seems that we might use the language habits as a substitute for consciousness. This would simplify terminology and explanation. What we are particularly interested in, however, are the facts involved. Here it appears that consciousness arises with language habits and is to be explained largely, if not wholly, by language habits. This points towards solution one, and from this standpoint consciousness might be identified with language habits and coördinations. Language habits might be substitutable for consciousness. It might be said that consciousness is language habits operating. Lashley calls the core of 'conscious' integration the 'verbogestural coordination.' Watson states that 'conscious' is merely a general phrase descriptive of the act of "naming our universe of objects both inside and outside." [1] John Dewey says, "Personally, I believe that the identification of knowing and thinking with speech [2] is wholly in the right direction." [3] Language habits would also include the case where the individual might have the proper habits without the name.[4] They would include thought, concepts, etc., as explained

[1] Watson, 'The Unverbalized in Human Behavior,' p. 280.

[2] Speech is evidently used here in a broad sense, similar in meaning to language habits.

[3] Dewey, John, 'Knowledge and Speech Reaction.' *J. Phil.*, **19**, p. 561.

[4] Weiss, A. P., 'Behaviorism and Behavior,' PSYCHOL. REV., **31**, p. 144.

before. Hunter spends most of his explanation of consciousness upon the language habit phase. Language ability according to him is behavior which is symbolic and can be reinstated at the proper time. This is contrasted with the ordinary stimulus-response activity, which is not 'conscious' behavior. Of course if, in opposition to the weight of factual evidence, the above solution is not accepted, we may have room for the term consciousness as a separate category in psychology, provided, however, that it be divested of its unscientific connotations. This would not necessarily deny a behavioristic statement of it. It is also well to admit that as yet we do not have sufficient data to explain consciousness completely. The purpose here is to show that a behavioristic explanation in terms of language mechanisms appears particularly hopeful as a scientific basis of attack upon the problem. Further facts in regard to the identification of consciousness with language habits will appear in the discussion which follows.

The rest of the paper I wish to devote to the view of language as a social category or process, although I would not limit the study of behavior to only that which establishes the social status of persons, as Weiss apparently does.[1] This presentation does not oppose the line of thought already developed. It is an attempt to see the influence of some of the social factors which may be involved in language and consciousness and to bring out further facts in regard to this problem of language mechanisms and consciousness.

The basis for the conception of language habits as a social process is the act and the stimulus-response situation. In actual life the stimulus and response are not separated from each other. As a matter of fact, there must be some sort of response before there can be a stimulus, and vice versa, there must be some sort of a stimulus before there can be a response. Behavior is a continuous process of activity. A response is in turn a stimulus for another response and this again is a stimulus for further response. In the physical process all that we have is a change in the system of tensions.[2]

[1] Weiss, 'Behavior and the Central Nervous System,' PSYCHOL. REV., **29**, p. 330. (See also other articles by Weiss.)

[2] Dewey, John, 'The Reflex Arc Concept,' PSYCHOL. REV., **3**, p. 364.

The only way that we get a separate stimulus or a separate response is by a process of abstraction [1] whereby we call the stimulus a certain phase of a coördination which represents conditions which have to be met for the completion of it, while the response is the phase which represents the conditions that serve as means for effecting the successful coördination.[2]

If the stimulus is a phase of the coördination which represents conditions that must be fulfilled for a successful completion of the coördination, then the stimulus defines or indicates what the response or the rest of the coördination is to be. The response also defines or indicates what has been the stimulus or preceding conditions for this response. In other words, one part of the act, or coördination, defines another part of the act.

This continuous character of behavior and action is particularly important. If what has been said about the definition of one part of the act by another is correct, then the meaning of the first part of the act is found in the rest of the act. The meaning of one act is another act, the meaning of this act is still another act or series of acts and so on. All there seems to be in meaning after all is activity. Lashley expresses a view somewhat similar to this in his article, 'A Behavioristic Interpretation of Consciousness.' [3] Meaning is not the ephemeral intangible thing we have been wont to consider it, but definite concrete acts.

In social life our habits and acts have been developed coöperatively. Other persons complete our acts for us. We also complete their acts. But as long as response is to immediate stimuli there is nothing which need be called

[1] It has been suggested that external stimuli may be new data, independent of the preceding response. It is true that these external stimuli may be new data, but the organism must respond to the stimulus before it becomes a stimulus; it must be receptive in some way to the stimulus. The previous state of the organism would determine to such an extent that the stimulus could hardly be said to be independent. Thus from the standpoint of the organism the stimulus could be thought of as being part of the response to previous responses, and hence the separate stimulus would be an abstraction. From the standpoint of the discussion the close interdependence is the essential point.

[2] Dewey, John, 'The Reflex Arc Concept,' PSYCHOL. REV., 3, p. 370. See other parts of this article for a more complete explanation.

[3] *Vide*, p. 259.

conscious[1] or which would necessarily involve language habits. And as long as the interaction of individuals is carried on upon the basis of direct response to stimuli, we are not called upon to use language habits.

Now in such coöperative activity as we have in social life, it is clear that a large number of potential stimuli are not present. The greater the coöperation, the larger this number of potential stimuli will be. Further, it appears that if the individual were able to furnish a substitute for these absent stimuli, he would be defining or getting the meaning of his own actions or responses, for the stimulus defines the response and he would be indicating to himself the nature of the absent stimulus. He would be able to function much more adequately. This kind of activity, of course, would be the operation of language habits according to the definitions of them which were given above. It would be *actual* behavior; to be less specific it would be thinking.

If this explanation of language habits as substitute action and the relation of stimulus and response is correct, it seems that the only possible way for a language habit to develop would be for the organism in some manner to take the rôle of another individual or object and stimulate itself in the same manner that the other individual or object stimulates it. In this manner it would develop signs and symbols which would signify absent objects, and also present activity.[2] As Mead states, "Significance has two references—one, to

[1] As long as we use the terms conscious and consciousness, I see no reason for restricting their use to the characteristics of man only. It seems that self-consciousness, if the term consciousness is to be used, significant behavior, language habits, and such terms can adequately describe the distinctive character of man's behavior. However, in psychological literature it has been common to speak of consciousness to designate these particular human characteristics, with the implication that other animals do not possess it. Consciousness is used with a broader meaning as well. It is in the restricted sense that consciousness is used in this paper, not as a matter of preference, but as a matter of expediency. It seems that it might be advisable to substitute for consciousness more exact words, such as language habits, significant behavior, and similar terms.

[2] G. H. Mead has developed this concept in several articles. See 'A Behavioristic Account of the Significant Symbol,' *J. Phil.*, **19**, pp. 157–63; 'The Social Self,' *J. Phil., Psychol. & Sci. Meth.*, **10**, pp. 374–80; 'The Mechanism of Social Consciousness,' *J. Phil., Psychol. & Sci. Meth.*, **9**, pp. 401–6.

the thing indicated, the stimulus-object; the other, to the response (present activity) or the meaning." [1]

The possible ways whereby an individual or other organism could thus take the rôle of another person or object and stimulate itself in the same way that the other stimulates it, appear limited.

Any mechanism whereby the organism could do this would be sufficient to develop consciousness and language habits. But it is difficult to see how language habits would have ever developed if it were not for the vocal and auditory habits. Vocal habits have been developed more extensively by man than by any other organism. Here one individual's voice may be substituted for another individual's voice. The small baby, *A*, in the company of another baby, *B*, who is crying, often seems unable to tell whether it, *A*, is crying or not. And often *A* does begin to cry. It is a matter of common experience that children stimulate themselves in a seemingly endless round of responses such as 'da-da-da-da-da-da-da,' and later they carry on conversation with themselves by taking the rôle of an absent playmate.[2] We hardly have another mechanism so well adapted to perform this function of substituting our own stimulus for another stimulus as is the human voice. It is heard by the ear as another person's voice is heard.

It is clear, of course, that if we have depended upon the speech mechanism for the first language habits, they are later transferred to bodily gestures and movements. Also after they have been developed, we are able to transfer or teach them to individuals without an adequate speech mechanism. But this is done by an elaborate technical process. It is doubtful whether such persons would develop language habits spontaneously. If it would be possible for such persons, a colony of deaf mutes for instance, to develop language habits, it would probably be on account of the possession of a more complex brain and nervous structure

[1] *Vide*, 'A Behavioristic Account of the Significant Symbol.'

[2] For a very good graphic explanation of this type of activity see Allport, F. H., 'Social Psychology,' 1924, Chapter VIII, particularly pp. 178–89. And Cooaley, C. H., 'Human Nature and the Social Order,' 1922, Chs. V–VI.

which would enable them to produce substitute stimuli in other ways. It is somewhat doubtful, however, whether this would suffice. The way to settle such a question, of course, is by experiments and further observations in this field.

The above view which has been set forth as an explanation of language habits gives us also an explanation of consciousness. It is by this type of behavior that we get the meaning of activity. It is the process whereby we get ideas, concepts, knowledge; the process of consciousness. This mechanism of taking the rôle of others, of developing language habits seems to be the 'mental' process and what we call 'mind.' Mind is not something wholly encased within the skull.[1] Dewey's view corroborates this.[2] He states that "not only can two persons know the same object, but a single personal reaction *cannot* know an identical object." "As a single and singular being, I may make a primary non-cognitive reaction to a stimulus." [3] It is the reaction of significance for other individuals, as well as ourselves, that gives us knowledge.

Weiss' view appears to be in line with the above conception, although he does not explain as clearly the mechanism by which language habits develop. He classifies responses into three categories: biophysical, implicit, and biosocial or overt responses.[4] The biophysical response is the muscle-twitch phase. The biosocial response "is the group of movements or the effects of these movements that other individuals observe and classify as belonging to the educational, vocational, administrative, recreational, and personal forms of behavior." [5] They are the responses that determine our social status. They are understood by persons of the same social status. The biosocial response is the characteristic human response. Man's behavior is characterized by coöperation. Man 'is the only animal that has evolved the principle of receptor-effector interchangeability between

[1] Cf. Mead, 'A Behavioristic Account of the Significant Symbol,' p. 163.

[2] He refers to Mead's article, 'A Behavioristic Account of the Significant Symbol,' as the best article written on this subject.

[3] Dewey, 'Knowledge and Speech Reaction,' *J. Phil.*, 19, p. 566.

[4] Weiss, 'Behaviorism and Behavior,' p. 119.

[5] *Ibid.*, p. 137.

organisms.'[1] This makes possible the development of language habits. As a matter of fact, the biosocial response is only the stimulus-response category known as language.[2] This is very similar to Mead's concept of taking the rôle of the other by the use of signs and symbols. Words form the basis for generalization and abstraction. Words and symbols come to stimulate for relations between stimuli and thus furnish this basis.[3] We think by this process.

The biosocial responses furnish the basis for the implicit responses. "For the behaviorist the genesis of the implicit response lies in the auxiliary responses which occur during the learning of new overt responses, particularly those of the social or coöperative type." These auxiliary responses remain and furnish the basis for imagery. Implicit motor patterns functioning is having an image. To describe an image you stimulate the other persons to respond as you responded. That is, you produce in them a motor pattern similar to the one which you had from the original situation.[4] This is similar to Dewey's conception of a mathematician's or chemist's treatise as a behavioristic guide of what the reader will have to do in order to see the things that the author has responded to with certain statements.[5]

If it should turn out that this view of language habits and consciousness as a social category is correct, it would appear to be quite significant from the standpoint of the science of human behavior, and, possibly, from the standpoint of division of labor. It may mean that behavior as a science is to be divided into behavior as individual psychology studying individual behavior and finally putting it in physicochemical and neuromechanistic terms, and behavior as social psychology. The basis for a social psychology appears to be to a large degree just this symbolic character or equivalence of responses which we have in language habits.

[1] *Ibid.*, p. 50.

[2] Weiss, 'Biophysical versus Biosocial Equivalence in Human Behavior,' Program of the Amer. Psychol. Assn., PSYCHOL. BULL., 21, p. 87.

[3] Weiss, 'Behaviorism and Behavior,' p. 140*f.*

[4] *Ibid.*, p. 130.

[5] Dewey, 'Knowledge and Speech Reaction,' p. 566.

Weiss lists three points under the essential characteristic of the social category: (*a*) The neuromuscular character of a response is relatively unimportant as compared with its effect as a stimulus for other individuals. (*b*) Physical units of measurements represented by calories, watts, foot-pounds, etc., are relatively inadequate to measure this stimulating effect. (*c*) The individual is classified not on the basis of physical or psychological properties, but on the basis of his coöperative effectiveness in the social organization of which he is a unit.[1] He maintains that "neurology cannot explain even the simplest of the social interactions until a biosocial analysis has been made." In other words, it appears that the biosocial reactions are to be classified and analyzed from the standpoint of the social situation. Different forms of the biophysical response may be equivalent stimuli from the social standpoint.[2] For example, there are a number of physical methods of inviting a person to dinner and they all may produce the same response, namely, that the invitation is accepted.

If these language habits and responses are to be analyzed from the social standpoint, then our basis for scientific generalization is not so much the individual as the responses to a social situation or social value.[3] This would furnish a basis for a science of social psychology.

On the other hand, it must be recognized that these and other reactions can be reduced to the reactions and behavior of individuals involved as individuals. This then furnishes a basis for generalization which is the individual, and consequently for a science of individual psychology.

Of course, the individual is of fundamental importance in either case. Also a scientific and mechanistic explanation is involved in either case. An individual is an aggregate of electron-protons. As Weiss states, from the standpoint of physical monism, he is to be regarded as a locus in this move-

[1] Weiss, 'Behaviorism and Behavior,' p. 118.

[2] Weiss, 'Biophysical versus Biosocial Equivalence in Human Behavior,' p. 86*f*.

[3] The social situation and stimuli, of course, must be understood. Cf. Bernard, L. L., 'Present Trends in Social Psychology.' *J. Social Forces*, 2, pp. 738–43, which appeared after this was written.

ment continuum which makes up our universe; and a function (in the mathematical sense) of the changes that are occurring in all the other electron-proton aggregates.[1] Thus the activity or behavior of individuals is to be explained in scientific terms the same as all chemical and physical processes. When the individuals are taken as the loci of uniformity, we have one basis for generalization in regard to behavior. When the responses of individuals to social situations or social values are taken as the loci of uniformity, we have another basis for generalization in regard to human behavior and personality.

Two such divisions of the science of behavior would not be contradictory, but supplementary. It might mean a very helpful division of labor[2] and one that has already been indicated by Woodworth's classification. Of course, it is not the point of this paper to insist upon a division of labor in scientific discipline—the above is only suggestive—the point is to indicate the significance of language habits in the study of human behavior.

By way of conclusion, it may be said that the explanation of consciousness as language habits or significant behavior seems to be of considerable importance in making psychology and social psychology scientific, as well as opening a large field for study and experimentation. It helps to furnish a behavioristic basis in social psychology for a scientific explanation of the process of social interaction, of the development of the concept of 'self' and of 'others,' of social status, of social influence and social control. In the individual psychology it furnishes a behavioristic account of a certain type of behavior of individuals. It should be remembered, however, that analysis must not stop here, but must be pushed on as far as possible, otherwise language habits may become another fetish similar to consciousness, a verbal cloak for ignorance.

[1] Weiss, 'Behaviorism and Behavior,' p. 40.

[2] As for social psychology, up to the present the sociologist has not treated it to the satisfaction of the psychologist nor has the psychologist treated it to the satisfaction of the sociologist. Under what head this will eventually fall as a discipline remains an unsettled question.

Summary

The view set forth is that mind is behavior and that consciousness may be explained behavioristically in terms of language habits and coördination. A language habit is a word-stimulus or action-stimulus which is a substitute for or symbolic of a bodily habit or process, and an absent-stimulus (this does not mean that at no time can the stimulus be present). The substitutive character in regard to these two factors is an important consideration of the definition. Language habits are built up as conditioned reflexes and conditioned reponses of various orders. Language habits include much more than speech reactions; the whole body may be involved. Thinking is language habits operating and it is probable that part of thought goes on by central connections.

Language habits may be looked upon as a social process whereby persons get the meaning of their actions or responses by taking the rôle of other individuals. This is possible because stimulus and response define each other and a person by stimulating himself as another does thereby define his own activity. Meaning is activity—one act defines another act. The vocal habits, auditory habits, and coöperative activity make it possible for one individual to take the rôle of another. This process gives us symbols, signs, concepts, ideas, thought, i.e. the mental process or the process of consciousness.

Thus, in the study of human behavior, language habits furnish a very hopeful source of material which may be used to explain consciousness as an objective mechanistic process.

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CONTRIBUTIONS TO THE PSYCHOLOGY OF NUTRITION

II. THE SUCKING REACTION AS A DETERMINER OF FOOD AND DRUG HABITS

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Recent physiological research upon the reflexes of the glands of the digestive tract have thrown much light upon the significance and determination of many practices connected with the taking of food. It is now well established that the conditions surrounding the meal have a potent effect upon the digestive process. To eat in a pleasant room, with good company, possibly with the accompaniment of music, to have food that is not only chemically well cooked, but also attractively served, to devote oneself for the time being wholeheartedly to the business of feeding, all these things directly promote the free flow of the salivary and gastric juices and encourage the effective action of the digestive tract. But there are a number of food practices, or practices closely related to feeding, that seem to call for another explanation. Most important among these are what might be called the mild drug habits, which certainly play a very considerable part in the lives of every civilized people—the consumption of nicotin, theobromin, caffein, and small amounts of alcohol. To these may be added certain phases of the 'candy habit.' It is usual to suggest that these practices have their utility and meaning as factors in a conventional sociability which itself stimulates the secretory responses. But such an explanation, while it involves a measure of truth, seems hardly adequate. Aside from the fact that the chewing of gum and tobacco are not conspicuous manifestations either of social grace or good fellowship, it would still have to be explained why sociability should so

persistently and typically express itself through activities like the drinking of tea and coffee and alcohol, and smoking, all of which seem to have a vitality not possessed, for instance, by the snuff habit. It is the thesis of the following pages that these 'mild' drug habits, together with a number of practices and preferences more definitely concerned with foodstuffs, such as candy habits, are to be regarded as essentially survivals of infantile sucking projected into the medium of adult social intercourse, and that it is from this that their peculiar urgency and persistence is to be explained.

As a preliminary to a detailed analysis of the habits and practices in question it is necessary to discuss the rôle and significance of the sucking reaction as an element in human behavior. To this subject psychoanalysis has called special attention. The Freudian school in particular regards it as a sexual manifestation. According to their views, infantile sexuality is relatively undifferentiated, and lacks genital fixation. Freud himself makes sexuality equivalent to organic pleasure,[1] and among his followers we often find still more extreme and positive assertions to this effect. Infantile sexuality, moreover, is supposed to focus specially about certain erogenous zones, one of which is constituted by the mucous membranes of the lips and mouth, and this is advanced to explain the strong exploratory and manipulative interest in these regions displayed by children. Thus sucking becomes the most important instance of a so-called 'lip erotism,' which is a normal manifestation in the infant, but in adult life a perverse tendency which nevertheless always persists to some degree and in some forms in normal individuals. This 'lip-erotism' is regarded as the basis of practices such as kissing, smoking, and candy eating.[2]

Before we can advance a step towards a genuine comprehension of the significance of the sucking reaction in human life, it is necessary to deal with this theory, which seems to be entirely indefensible. To claim, as Freud does, that what he calls 'pleasure sucking' is a sexual manifestation

[1] Freud, Sigmund, 'A General Introduction to Psychoanalysis,' p. 280 *ff.*

[2] Hug-Hellmuth, H. von, 'A Study of the Mental Life of the Child.'

is purely gratuitous.[1] This conclusion is arrived at either by the tortuous and doubtful road of psychoanalytic 'explorations' of the unconscious of adult psychopaths, or by objective observations of children which are truly amazing in their superficiality and carelessness. If the child's eyes gleam and grow moist, if its breathing becomes deeper, if a period of relaxation suddenly supervenes upon a period of tension, it seems ample evidence for an entirely confident diagnosis of sexuality.[2] Jung at least partially repudiates this view in favor of the far saner interpretation of sucking as what it obviously is at bottom, namely, a nutritional phenomenon.[3] And the fatal difficulty which confronts the Freudians is well summed up in Moll's blunt comment: "With just as much reason every movement might be regarded as sexual—as for instance, the clenching by a child of its little fist." [4]

One further and more special objection must be noted on account of its intimate bearing upon our whole discussion. It may be questioned whether as a matter of fact the lips constitute an original erogenous zone at all. Such regions as the breasts and buttocks are in direct neural and harmonic connection with the primary sexual mechanism. But this is not the case with the lips. Of course, it is true that the kiss is very often, and perhaps in normal adult life, always, a sexual manifestation. But it is suggested that this is an acquired rather than an original character. This may seem somewhat strange in view of the admittedly strong algedonic interest that centers about the mouth. But on rigid physiological grounds we seem justified in denying the originally erogenous character of the oral mucosa. Thus the interest centering about this region, which later in life becomes partially integrated with the vast constellation of the sexual behaviors, is to be explained on other grounds.

This explanation is at once forthcoming when we remember that the sucking function is an essential element in the most important as well as the earliest piece of learning that human

[1] Freud, Sigmund, 'Three Contributions to the Sexual Theory.'
[2] Cf. Hug-Hellmuth, *op. cit.*
[3] Jung, C. S., 'The Psychology of the Unconscious.'
[4] Moll, A., 'The Sexual Life of the Child.'

beings are ever called upon to undertake, namely, learning to eat. Elsewhere the present writer has endeavored to analyze its rôle in this connection.[1] With the new-born infant, sucking is the only well organized and definite external chain reflex. It is especially remarkable in being initiated by almost any mild and pleasant stimulation. Its evident function is to provide a means of persistent buccal experimentation, by which at first any convenient substance, eatable or otherwise, is taken into the mouth and dealt with, but which later, under the influence of a complex group of factors, narrows down more or less to the *edibilia*. In this way the infant learns the essential lesson that gastric hunger pangs arising from contractions of the empty stomach can be inhibited by the taking of food. Thus the specific sensation of hunger, which at first amounts to no more than unpleasantness, comes to stand for the need of food. Such an analysis makes the biological importance of sucking very clear, and explains why it persists so prominently in infantile behavior. Of particular significance, too, is Watson's finding that failure or inability to complete the reaction by swallowing is suggestive of retardation, and that such difficulties are often found in children of defective parents.[2]

Watson's description of the motor side of the sucking reaction is fairly adequate. "The series of reflexes as a whole is made up of tongue, lip, and cheek movements, swallowing being the final link in the chain of activities." The complete reaction, culminating in actual swallowing, seems to become rather definitely tied up to the general nutritional response system, so that we tend to go through with the performance only when dealing with edible or potable substances. It is this consolidation of sucking with feeding that differentiates adult from infantile sucking. But though the adult may only tend to receive into the mouth, chew, suck, and finally swallow appropriate material, many traces of the infantile, undiscriminating, reaction undoubtedly persist throughout life. The reason for this seems obvious

[1] Mursell, James L., 'Contributions to the Psychology of Nutrition. I. Hunger and Appetite.'

[2] Watson, John B., 'Psychology.'

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enough. When a reaction biologically so stable and so urgent as infantile sucking becomes consolidated in a wider totality of behavior by means of association, it by no means loses its independent existence and vitality. The process of integration is not likely to be absolutely complete. Strong inhibitions are set up against the actual swallowing of such things as paint, pins, rubber bands, and so forth, and to that extent the complete sucking reaction as described by Watson is definitely specialized to certain favorable substances. But there are no such inhibitions against bringing various things into contact with the lips and tongue, taking them into the mouth, and rubbing them against the internal mucous membranes. As a matter of fact the business of teething probably tends to facilitate rather than inhibit such performances. A very little observation, whether on oneself or others, will certainly bring to light strong evidence of the remarkable persistence of buccal plays in the behavior of adult human beings. 'Sucking one's teeth,' fumbling with the lips, chewing pencils, and so on are all to be interpreted as vestigial survivals of true infantile sucking, which is only partly educated and assimilated.

We now turn to consider how these vestigial survivals of infantile sucking influence and motivate the mild drug habits, and certain food practices closely related to them. One of the most usual apologies for the use of tobacco, coffee, and the like is that while they may to some extent impair efficiency, they make possible a very complete condition of 'relaxation,' which more than makes up for deleterious toxic effects. Relaxation is a concept of which much has been made in recent psychological discussion, particularly under the influence of efficiency studies, but we cannot but regard its general and undefined use as exceedingly risky. It is not even clear that there is any such condition as general relaxation. All that we positively know is that a certain alternation of rest and work, and a certain kind of rest will tend to bring a certain function to optimum efficiency. For instance, a ten-minute rest period every hour, with the feet elevated, will secure optimum efficiency in long distance

walking, as has been established by the practice of the French Army, but to regard this as typical of general relaxation would be absurd. Thus it becomes evident that we cannot lump together all the habits and practices in question, and treat them *en masse* as means of securing general relaxation. Our first step must be to deal with them individually. And in each case we must first ask how, if at all, they affect various functions, and second, whether such effects as they have are due to their chemical properties or to other factors, or, if such effects are negligible, why they continue to be used.

1. To begin with the clearest case of a strong influence attributable to vestigial traces of infantile sucking, we may take the tobacco habit or habits. Until quite recently very little of value was known about the specific effects of tobacco upon the system, because a suitable technique had never been devised for the administration of control doses. Rivers has clearly pointed out how indispensable such a technique is if we are to disentangle the specific chemical effects of a drug from the psychic effects consequent upon taking it.[1] When laboratory studies are initiated without this precaution, they are almost certain to be vitiated by such factors as prejudice on the part of the subject for certain results, the special interest and excitement arising out of taking a substance with a view to discovering what its effects will be, and also the general effects of taking the substance into the mouth and swallowing it. These can only be eliminated if from time to time a neutral substance can be introduced without the subject's knowledge. Where this is not done, results are almost worthless, and it has been regarded as impossible in the case of tobacco. A short time ago, however, this problem was solved by Hull, and with very striking outcomes.[2] Hull employed a pipe equipped with a very ingenious device for heating and moistening the air that passed through the bowl. The pipe so equipped was placed in the mouth of the blindfolded subject, a pretence was made at lighting it, precisely as the ordinary pipe was lighted when

[1] Rivers, W. H. R., 'The Influence of Alcohol and Other Drugs on Fatigue.'

[2] Hull, Clark L., 'The Influence of Tobacco Smoking on Mental and Motor Efficiency.'

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tobacco was actually being used, and at the same time a third person began smoking in the room, so that the odor was present. And in every detail the procedure employed when the subject was given tobacco was followed out. It proved that the subject was entirely unable to tell when tobacco was being used and when it was not, and thus a control condition was adequately maintained.

The results of this investigation are sufficiently surprising. In the first place, it should be noted that tobacco, at least as used by habitual smokers, seemed to have very little specific effect. Twelve functions were taken for special study, and smoking had unmistakable effects upon only three. Of these three, two were pulse and tremor, essentially physiological, and the third was addition. Hull's somewhat intangible conclusion is that the use of tobacco seems somewhat to increase the efficiency of "ordinary routine thinking, which is essentially the functioning of old associative bonds," but to decrease efficiency where "new associative bonds are in process of formation, as in most school learning." This conclusion, however, depends upon a questionable interpretation of some of the tests used. In general the striking outcome so far is the small specific effect of tobacco upon the functioning of the organism. Alongside this we must place the special reactions found in subjects to the control dose. In every case the subject was unable to tell when he was smoking tobacco and when he was not. And very frequently the introspective protocols attest greater pleasure and satisfaction from the control dose of moist warm air than from the actual dose of tobacco. "It would be an easy matter for S to break off smoking if it were always like last night" (tobacco dose); "S thinks it would be pretty hard to quit under such conditions" (control dose); "S always felt rather hungry for a smoke when he first came into the laboratory. But after the smoke in the laboratory he was *always* satisfied" (italics mine); "S feels that such satisfaction as last night constitutes a real habit, but not too strong to be overcome" (control dose); these are typical statements.

Thus we seem driven to an inevitable conclusion. The

drive behind the smoking habit cannot be due to the specific effects of tobacco as a drug, for these are negligible in any case. They cannot be due to the taste of tobacco smoke, for it has no taste at all, as is well attested elsewhere by the experience of the blind in smoking. Odor may in some cases constitute a real incentive, but the extracts from the protocols quoted above would seem to show that very often the odor of tobacco smoke is found disagreeable rather than otherwise, and that the individual smokes in spite of rather than because of it. It seems clear that all we have left is the pleasure of holding the pipe in the mouth and filling the mouth with warm moist gas. If this seems fantastic, the only reply is that Hull's very careful study literally strips smoking down to nothing but this and this alone. And furthermore, actual smoking practices would seem strongly to confirm such an interpretation. If the element of buccal play and manipulation were not very prominent as a determiner, it is hard to see why one form of tobacco should be preferred to another. Yet we find great differences in this respect among individuals and races, some finding their main satisfaction in cigarettes, others in cigars, others in pipes, and so forth. Taking tobacco by way of the nose is comparatively uncommon, though chewing is a frequent enough practice. But either the drinking or injection of solutions of nicotin, or the taking of the drug in capsules is very uncommon. Clearly what is wanted is not a dosage of nicotin, but an opportunity for buccal play. It may then be asked why people continue to use tobacco when the same or greater satisfaction could be obtained by inhaling warm moist air through a convenient pipe. The only answer seems to be that convention, backed up by the immense persuasive and suggestive power of advertising, imposes upon the public a drug which is often more or less offensive even to its habitués, but whose objectionable effects are counterbalanced by the peculiar pleasure obtainable from the ritual of taking it. As a matter of fact we do find occasional cases of persons who are great tobacco addicts, and who, when they find that their literary and intellectual productivity falls off without its use, while

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at the same time it has unfavorable physical effects, simply substitute some inert substance, which is smoked with equal pleasure and benefit. This has been reported to be the case with Maeterlinck.

2. We now turn to a consideration of the use of alcohol, which presents much the same features with some differences of detail that are instructive. Here again we have a drug whose effects, though more marked than those of the nicotin taken in smoking tobacco, are not very pronounced, even with a dosage much larger than that ordinarily taken for social purposes. In general it operates to depress all the reflexes that have been studied under its influence, though not to an undue degree, and to diminish motor efficiency by increasing tremor and decreasing accuracy. However, the range of individual differences in this last respect is quite wide, so that all generalizations about the alcohol habit are always open to error. According to Rivers,[1] the effect of small doses of from 5 to 20 c.c. of absolute alcohol upon ergographic work is *nil*, either immediately or several hours after their administration, though heavier doses are likely to be depressing. The investigation of Dodge has shown that the more complex functions, such as memory, thinking, and so forth, show on the whole less effect than the simple reflexes, though where they are affected at all it is in the direction of depression. Watson, in commenting on these results, remarks that they are precisely contradictory to common expectation, for it is usually supposed that the social consumption of alcohol speeds up the mental processes, and that in general the drug works as a stimulant.[2] That in these circumstances, mental processes do become accelerated, and emotional reactions exaggerated, is an observation too familiar and supported by too much classic testimony to be denied. But it evidently cannot be due to the actual dosage of alcohol involved.

How then are we to explain the stimulating effects of beverages whose active principle is a drug the results of

[1] Rivers, W. H. R., *op. cit.*

[2] Watson, John B., 'Psychology.'

which are either neutral or depressive? Watson, recognizing the seriousness of this difficulty, has put forward an explanation which seems hardly tenable. "While the dinner as a whole might be a failure without it, the primary effect of alcohol is probably to bring about an increased glandular activity which raises rapidly the general emotional level of the individuals partaking of it. *This is pure speculation*, since the author knows of no work which tests the effects of alcohol upon internal secretions. All that we argue for here is that the sight of the wine or cocktail may start conditioned secretory reflexes" (italics mine). It is extremely difficult to believe that visual stimulation could possibly affect the social situation as profoundly as this seems to suggest. And if, as a matter of fact, everything turned on conditioned secretory reflexes, why would it be necessary to drink the beverages at all? Why not merely sit and look at them? And above all, why should it be necessary that the drinks should contain alcohol or at any rate seem to?

Watson, however, has yet a further comment which seems to give us a clue towards the true solution. "While possibly no good physiological reason can be assigned for it, the different forms of alcohol seem to produce differences in the liveliness of a given company. The consumption of the same amount of grain alcohol at a social gathering will not produce the same effect as will an equal amount of alcohol in the form of champagne or a cocktail. *The liveliness which ensues during social functions is not wholly due by any means to the alcohol which is taken*" (italics mine). Once more then we seem thrown back upon the factor of oral manipulation, which indeed Feré sometime ago recognized as important in determining drug effects, but without in any way making it central. The different forms of alcohol are served in different ways and consumed with different rituals, and it seems beyond question that this must have a profound effect upon all the reactions of the organism. Here again we are dealing with an obvious conventionalization of one of the most primitive, deep-seated, and important reactions in the repertory of human beings. Everything attests that it is on the con-

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ventionalized act of drinking that the effects of the social consumption of alcohol depends. What other explanation can we have of the service of different alcoholic substances at different stages of the meal, of their being offered in specially shaped glassware, and of the civilized rite of slowly sipping rather than gulping wine? Again, the adoption of such names as cocktail, wine, or beer, for various non-alcoholic beverages is evidence of a strong, half unconscious tendency to excuse the practice of social drinking by building round it a hedge of conventions and forms. Such terms as those above mentioned would not be persistently employed unless they tended to help sales, and they would not help sales unless there was some element of positive value in the convention itself, absolutely irrespective of the chemical content of the substances being consumed. Just as the baby responds to mildly pleasant stimulation, or gives expression to its general euphoria by the sucking reaction, so the sophisticated group of diners express, and by a course of cyclic stimulation enhance their enjoyment by buccal plays conventionalized as the social consumption of alcohol. And once more, a high degree of conventionality is essential to the situation, because here we have a persistent infantilism, which otherwise would be regarded as more or less disgraceful.

3. With regard to caffein the case is decidedly different, for here we are dealing with a drug which has directly beneficial specific effects. The conclusions of Rivers in regard to its operation have on the whole been confirmed by later and more elaborate investigations. "The general practical conclusions to be drawn from the experiments I have recorded, and from those of previous workers, is that caffein increases the capacity for both muscular and mental work, this stimulating action persisting for a considerable time after the substance has been taken without there being any evidence, with moderate doses, of reaction leading to a diminished capacity for work, *the substance thus really diminishing and not merely obscuring the effects of fatigue*" (italics mine). Thus drinks containing caffein are undoubtedly taken partly for the sake of the specific effects of the drug itself. Further-

more, caffein is a habit-forming drug, and once habituation has been established, discontinuance will lead to various unpleasant physical symptoms. Thus it is that the consumption of caffein drinks—tea, coffee, and various soda-fountain beverages—is not and need not be surrounded and supported with the elaborate social ritual characteristic of taking alcohol. There is, so to speak, a *bona fide* reason for taking a dosage of caffein from time to time. But this is by no means the whole story. For most certainly the element of buccal play enters strongly into the situation here also. Otherwise, we cannot explain the special forms of preparation and service that are preferred. Tea drinking and coffee drinking are very distinctive national habits. Moreover, the beverages must be served either decidedly hot or decidedly cold, and in appropriate china or glassware. And the whole social-individual usage varies strikingly from country to country. Any one who has had the misfortune of watching and hearing an Arab or Turk sip his thick and almost boiling coffee from a tiny cup will have considerable difficulty in denying that buccal play has a great deal to do with the pleasure of the performance. Confirmatory of this it may be noted that in spite of the fact that caffein will abolish fatigue with very little indeed in the way of unfavorable after-effects, it is rarely that it is taken in any but the conventional forms. It is far more effective as well as far more usual to brew a cup of coffee as an intellectual stimulant rather than to take the same amount of caffein in the form of a dose, say, of citrate of caffein.

4. We may mention one case of a drug which does not come under our category of mildness, partly because it is somewhat widely used, and partly to exhibit the contrast involved in the psychology of the major habit-forming drugs with the foregoing. The substance in question is cocain. Its immediate effect is greatly to increase the efficiency of the function being tested. Rivers reports that natives of South America are able to perform great feats of endurance and to withstand hunger and thirst due to its influence. This is precisely what makes it insidiously dangerous. For

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unlike caffein it covers up rather than abolishes fatigue, and there is always a profound reaction. Such dynamogenic effects as are obtained from its use are clearly not of psychic origin. Buccal play has here an entirely negligible rôle, and the entire psychological and motivational setting of the major drugs is entirely different from that of the milder drugs.

5. Finally, we may enumerate some of the food practices which obviously seem to depend in large measure upon vestigial remainders of infantile sucking. Perhaps the most prominent of these is the use of candy. It is very notable that the use of candy has greatly increased since national prohibition was put into effect. A common explanation is that candy tends to 'take the place' of alcohol. But we have seen that the specific effects of small doses of alcohol are negligible, so it cannot be as a dynamogenic agent that candy serves as a substitute. But candy does offer a respectable chance to munch and suck and chew without exciting derision, and it is in this way that it provides the same enjoyment as that derived from intoxicating liquors. It is also worth while noting that there is a decided preference for the tougher and more lasting forms of candy. If candy eating were merely a means of receiving a ration of sugar, then evidently the preference would be for some such form as the soft-center cream, on which it is easy to satiate oneself in a very short time. But there is a special pleasure derivable from the humble all-day sucker and the more aristocratic caramel which the more readily soluble confections will not yield. And when we turn to chewing gum we have a perfectly clear case of an important commercial product whose sale absolutely depends on the ability of adult human beings to enjoy chewing and sucking for their own sake. Ice-cream, too, seems to belong to the same general classification. A custard containing a large amount of glucose, which would be rejected with disgust by most people if presented in liquid form, is eagerly eaten when properly frozen. This seems due partly to the pleasing effect of cool contacts upon the oral mucosa, and still more to the fact that the frozen substance

must be eaten slowly and with a good deal of mouthing. Much in table service, too, is due to the demand for pleasure from buccal play, as for instance the use of thin glass, china, and silverware.

So to sum up in conclusion, it seems clear that sucking carries a peculiar pleasure and significance of its own throughout life. It is not the 'lip-erotism' of the Freudians, for the pleasure is derivable not from mere stimulation of the oral mucosa, but from the reaction of sucking itself. And it has a very important bearing on food practice and convention. It may be asked why vestigial sucking should center upon alcoholic drinks, tea, coffee, tobacco, candy, ice-cream, and the like so exclusively. The answer has already been made in effect, but may now be generalized. Sucking is a characteristically infantile performance. It is a performance which would disgrace an adult, both in his own eyes and in those of his associates, almost as much as tears and loud wails in company. No doubt an ordinary comforter, or still better, a bottle, would really be eminently satisfactory. But the use of such a convenience would be humiliating to the last degree, and neither one's self-respect nor one's social prestige would survive. So conventional toys suitable to the adult condition are invented and exclusively used, and a ritual and tradition built up about them, which makes it possible to benefit from them in a social way, in the company of others. The explanations ordinarily put forward for their use—that is, that they help one to concentrate or relax, etc.—are partly rationalizations, for with tobacco and alcohol we have seen that their specific effects are largely fictitious. But partly they are due to the unrecognized, and in fact more or less repressed factor of buccal play, and so far they are real enough. Why this element should be relatively unconscious is well enough explained by the psychoanalytic doctrine of repression, which is true enough in so far as it amounts to saying that a grown-up person feels the strongest repugnance towards reverting to characteristically infantile modes of thought and behavior. Many of our actions, however, are shaped by the impossibility of ever escaping entirely from the infant which lives on in all of us to the day of our death.

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